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SUICIDAL MELANCHOLIA.

ACUTE MANIA.

EPILEPTIC MANIA.

DEMENTIA.

GENERAL PARALYSIS.

FRONTISPIECE.

From photographs taken by the author. See appendix B.

A MANUAL

OF

PSYCHOLOGICAL MEDICINE

Dr. Chas. K. Mills

AND

ALLIED NERVOUS DISEASES.

CONTAINING THE DESCRIPTION, ETIOLOGY, DIAGNOSIS, PATHOLOGY, AND TREATMENT OF INSANITY, WITH ESPECIAL REFERENCE TO THE CLINICAL FEATURES OF MENTAL DISEASES, AND THE ALLIED NEUROSES, AND ITS MEDICO-LEGAL ASPECTS, WITH A CAREFULLY PREPARED DIGEST OF THE LUNACY LAWS IN THE VARIOUS STATES RELATING TO THE

CARE, CUSTODY, AND RESPONSIBILITY OF THE INSANE.

DESIGNED FOR THE GENERAL PRACTITIONER OF MEDICINE.

BY EDWARD C. MANN, M.D.,

Member of the New York Medico-Legal Society, Etc.

WITH PHOTO-TYPE PLATES AND OTHER ILLUSTRATIONS.

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PREFACE.

I HAVE endeavored to present to the profession the subject of insanity, and allied nervous diseases, in a scientific, clinical, and forensic light, and in so concise a form as to be available for the student and general practitioner. The many kind words of encouragement which have attended my professional labors, researches and monographs, proceeding as they have from friends occupying high positions in the profession, notably the generous interest and recognition from Prof. Oliver Wendell Holmes, Dr. Pliny Earle, and others in this country, also from Dr. L. S. Forbes Winslow, London, England, encourage me to believe that this book on insanity and allied nervous diseases, the outcome of practical experience in the field of psychiatry and neurology, will be welcomed by general practitioners and students of medicine, and, I trust, may not be entirely devoid of interest to those in the same specialty as myself—neurology.

Psychological medicine occupies a position of authoritative science, to the elaboration of which has been directed, and is still being directed, the great ability of many of the most distinguished men in the ranks of medicine. Psychological research commands the respect of the enlightened world, because, industriously pursued from small beginnings and unsettled propositions, it has grown to the proportions of a well-defined and harmonious system of science. It has become the adjunct of jurisprudence in settling a class of difficult and otherwise inexplicable questions which arise in the administration of justice. The importance of psychology is evinced by the significant fact that the necessities of medical education demand that it shall be taught in the schools. Journals are especially devoted to its investigation, and, aided by hospitals and enlightened treatment, it has declared to the world that a large percentage of persons recently insane have been restored to their friends and society who, without such timely assistance, would have passed into the advanced stage of mental unsoundness. A very important point relating to

the prevention of mental disorders and the modern nervous diseases is, that the growth of mental function is as gradual as that of bodily power, and that brain-tissue degenerations and mental diseases may be separated by long intervals of time from the too premature and intense stimulation of the brain in school children which causes these nervous diseases. We meet with the preponderance of nervous diseases in the refined and cultivated classes, where, by premature and stimulating processes of education, there has been forced an elaboration of brain-structure, hastening the functional activity of the brain, with no due regard to the law of evolutional precedence. Normal growth and development will give us healthy mind, while a structurally degraded centric nervous system, or an altered quality of blood, and secondary disturbance of nerve-function, will antagonize healthy mental manifestation. If we have want of sleep, a defective generation of nerve-force, an unstable condition of the nerve-centres, an incomplete development of any part concerned in mental action, all of which Dr. Blandford, of England, has ably shown to be causes of mental disease, we cannot expect healthy mental function. Alcohol and opium are to-day responsible for much deterioration of brain. Dipsomania and the opium habit being on the increase among Americans, there is a greatly increased nervousness and an increasing inherited disposition to the different neuroses; and the condition known as cerebral hyperæmia, an increase in the quantity of the blood within the capillaries of the brain, or rather one form of it, of vaso-motor origin, resulting from overwork and mental strain, is greatly on the increase.

In diseases of the brain both the regional diagnosis and the pathological diagnosis are to-day attracting much attention, and the brilliant work of such writers as Drs. H. Charlton Bastian, L. S. Forbes Winslow, Bucknill and Tuke, Prof. Krafft-Ebbing, Drs. A. Voison, Foville and Luys, Clouston and Blandford, Loggia, Hitzig, Ferrier, Charcot and Lusanne, Brown-Séquard, and Hughlings Jackson, in England, Germany, France, and Italy, with the able work of our neurologists and asylum superintendents at home, makes the writer only too conscious of his own defects in this field of research.

Insanity is not only appearing at an earlier age than formerly, but there is also a decided increase of insanity disproportionate to the increase of population. Educational pressure on the young, to the neglect of physical exercise, the increasing artificial and unnatural habits of living, the great excitement and competition in business, are

all tending to induce and multiply nervous diseases, many of which must terminate in mental diseases. As to men, I think, modern nervousness is largely due to mental anxiety respecting business, the abuse of alcohol and tobacco, and sexual excess. These three things, in combination, will break down and shatter the strongest constitution, and induce ataxy, paresis, and insanity in those who inherit weak nervous systems from their progenitors. Regular hours, amusements to divert the mind from the cares of business, freedom from alcoholic stimulants, nourishing food at regular hours and properly digested, abstinence from tobacco during the years previous to puberty and until twenty years, and daily attention to the bowels, with free bathing, will keep most men in robust physical and mental health. Herbert Spencer, in his "*Social Statics*," page 413, speaks thus respecting the wise severity of nature's discipline:

"Partly by weeding out those of lowest development, and partly by subjecting those who remain to the never-ceasing discipline of experience, nature secures the growth of a race who shall both understand the conditions of existence, and be able to act up to them. . . . . And by multiplication of such warnings (the warnings of ignorance, and its consequence, sickness and pain) there cannot fail to be generated in all men a caution corresponding to the danger to be shunned. Are there any who desire to facilitate the process? Let them dispel error; and, provided they do this in a legitimate way, the faster they do it the better." Any work that we as physicians do towards influencing the public to study the laws of health, to reform their habits of living, to promote the use of baths, to encourage temperance, ventilation, and due exercise, and to further a knowledge of the human organism and the laws which regulate it, and in diffusing a knowledge of all the means necessary for the preservation of good health, will produce its exact equivalent of results in the *prevention* of insanity. We shall thus develop in the masses an intelligent, self-helping character, tending to robustness of body and robustness of mind. Nature has attached to ignorance of her laws or their non-observance certain penalties, and she always punishes every breach of these laws. All measures which we take to replace ignorance by wisdom will inevitably check the growth of insanity.

From our long experience and repository of facts, it is inexcusable if we cannot obtain some information, or if knowledge cannot be in some way secured, to check the increase of insanity. We, as physicians, must make it our concern, charge ourselves with this specific

duty, and continue it from year to year, and, although each individual's work may be small, the aggregate result will be immense for our fellow-men.

While I have freely expressed my own ideas on those diseases with which I am most conversant, and recommended the treatment which in my hands has proved the most successful, I would earnestly advise young practitioners to be guided in their treatment of both mental and nervous diseases by the symptoms and individual characteristics of each case, and not to adopt any routine treatment, if they would make successful practitioners.

I have to express my warmest thanks to friends for aid rendered me in various ways, but more especially to Dr. Robt. J. Hess of Philadelphia, and to William J. Mann, Esq., of the New York Bar. The former has kindly made a most careful study and critical analysis of the book, and has favored me with valuable suggestions respecting the arrangement of my work of which I have taken advantage, and by correcting the sheets during their progress through the press has laid me under many obligations. The latter gentleman, my brother, kindly consented to prepare the entire abstract of the laws relating to the care and protection of the insane in every State of the Union, greatly increasing the value of the book, especially to the legal profession, giving it a medico-legal importance which otherwise it could not have had.

28 West Thirtieth Street, New York, Oct. 1st, 1883.

CONTENTS.

PAGE

CHAPTER I.

ON INSANITY IN GENERAL, ITS HISTORY AND CLASSIFICATION, . . 37

CHAPTER II.

THE ETIOLOGY OF INSANITY, AND THE IMPORTANCE OF ITS EARLY RECOGNITION AND REPRESSION IN THE INCIPIENT STAGES.

Insanity caused by defect of nerve-force and an unstable condition of the cerebral centres—By incomplete development—By ill-health—Intemperance—Grief—Loss of friends—Mental anxiety and sleeplessness—Blows on the head, etc.—Causes, predisposing and exciting, ... 52

CHAPTER III.

PREVENTION OF INSANITY, ... 64

CHAPTER IV.

DIAGNOSIS AND PROGNOSIS OF INSANITY, ... 67

CHAPTER V.

CIVIL INCAPACITY—LEGAL TESTS OF RESPONSIBILITY—HINTS FOR GIVING TESTIMONY, EXPERT TESTIMONY, AND THE FUNCTIONS OF EXPERTS IN INSANITY, ... 86

CHAPTER VI.

GENERAL PARALYSIS OF THE INSANE (DEMENTIA PARALYTICA), . . 95

CHAPTER VII.

IDIOCY—DEMENTIA—FOLIE RAISONNANTE (REASONING MANIA).

Moral and affective insanity—Impulsive insanity, ... 105

CHAPTER VIII.

MENTAL RESPONSIBILITY AND THE DIAGNOSIS OF INSANITY IN CRIMINAL CASES, ... 119

CHAPTER IX.

PAGE

THE HISTOLOGY AND FUNCTIONS OF THE BRAIN, ... 131

CHAPTER X.

THE PATHOLOGY AND MORBID HISTOLOGY OF ACUTE AND CHRONIC INSANITY.

The membranes—Epithelium—Nerve-cells—Nerve-fibres—Special morbid conditions of gray matter—The neuroglia—Sclerosis—Bloodvessels and sympathetic nerve-cells—Examination of blood and urine from the insane, ... 139

CHAPTER XI.

CASES ILLUSTRATING PATHOLOGY AND MORBID HISTOLOGY OF INSANITY, ... 153

CHAPTER XII.

TREATMENT OF INSANITY.

General observations—The brain to be looked at as a whole, and medicines must be calculated to act upon it through the general system—Insanity a curable disease if promptly treated at the outset of the disease—If neglected, soon tends to induce organic degeneration, which renders it incurable—Moral treatment—Choice of asylum—Proper attendants—Food—Work—Amusements—Medicinal treatment—Question of non-restraint—Home treatment of the quiet insane as private patients in private dwellings—Dr. Maudsley's opinion—Lunacy Commission—Opium—Hydrate of chloral—Hyoscyamia—Digitalis—Ergot—Bromide of sodium—Bromide of lithium—Bromide of zinc—Phosphorus—Strychnia—Iron—Calomel—Tincture cannabis indica and sodium bromide—Prolonged warm baths with cold to the head—The galvanic current of electricity in congestive states and as a tonic to the central nervous system—Opium effectually antagonizes suicidal melancholia when used in connection with prolonged warm baths—Tincture black hellebore and apiol as emmenagogues—Combinations of sedatives in insanity generally the best practice—Monobromide of camphor—Fothergill's solution of hydrobromic acid—Chloro-phosphide of arsenic (Routh's formula)—Conium—Cases illustrating the treatment of insanity—Views of Dr. Pliny Earle, Dr. John P. Gray, Dr. Thomas S. Kirkbride, Dr. Henry P. Stearns, Dr. Nichols, and others, ... 157

CHAPTER XIII.

INSANITY IN THE MIDDLE STATES.

Insanity increasing disproportionately to the increase of population—New York: Utica Asylum—Hudson River State Hospital at Poughkeepsie—The State Homœopathic Asylum for Insane at Middletown—Buffalo State Asylum for Insane—New York State asylums for the chronic insane: The Willard Asylum at Ovid and the Binghamton State Asylum for the Chronic Insane—Kings

PAGE

County Lunatic Asylum at Flatbush—New York County asylums on Ward's and Blackwell's Islands—The New Jersey State Lunatic Asylum at Trenton, N. J.—The new asylum at Morristown, N. J.—The four Pennsylvania State hospitals—Insane in Delaware, in almshouses, etc., ... 266

CHAPTER XIV.

PROVISION FOR THE CHRONIC INSANE.

Large, expensive institutions a mistake, ... 271

CHAPTER XV.

LUNACY IN ENGLAND AND SCOTLAND.

The views of the late Dr. Forbes Winslow on the treatment of insanity, . . 275

CHAPTER XVI.

THE NECESSITY FOR A NEW METHOD OF INTRODUCING EXPERT TESTIMONY IN CRIMINAL TRIALS WHERE INSANITY IS ALLEGED AS A DEFENCE.

States should be districted and a physician in lunacy appointed for each district by the Governor—This board of psychological experts should constitute a State lunacy commission and examine all cases before trial—Dr. D. Hack Tuke's opinion—Laws of Austria—Laws of France—Law of insanity should be more conformable than it is with medical science—The immense medico-legal importance of the recognition of the mental condition that is the precursor of decided insanity: Depression, unwonted excitability, disregard of the minor proprieties of life, change of affections, sleeplessness, change of character, loss of self-control, and, finally, the downfall of the integrity of the intellect, . 296

CHAPTER XVII.

CODIFICATION OF THE COMMON LAW AS TO INSANITY.

Lord Justice Bramwell's opinion—Lord Justice Blackburn's opinion—Opinion of the Lord Chief Justice of England and of Lord Moncrief, the Lord Justice Clerk of Scotland—Of the late Dr. Ray—Sir Fitzjames Stephen's attempt to codify the common law of England on insanity—The physician studies the whole history of his patient and his ancestry and searches for the causes of any bodily and mental changes that he finds, and thus arrives at the true pathology of the disease; while the lawyer and jurist are mainly interested in the *existence* of mental disease, its *degree*, and its *influence on conduct*—Why the apparent unwillingness to recognize disease in the homicidal act when the physician and jurist alike are willing to recognize disease in the suicidal act?—We must look at these questions by the aid of the light of modern pathology, as the Lord Chief Justice of England has done already—People born with a predisposition to insanity manifest slight symptoms for years, but not sufficient to induce their friends to treat them as insane—When an overt act *is* committed, who can question the value of a careful examination of the past life and acts of the accused?—His life has exhibited the natural history of insanity

PAGE

—The psychological expert can point out clearly to the jurist the unmistakable evidences of mental disease, which the latter, necessarily, alone and unaided, could not discover—There should be no rule of law that conflicts with the elementary truths of insanity, on which only such rules should be founded, . 302

PART II.

INTRODUCTORY CHAPTER ON MODERN NERVOUS DISEASES.

Neurotic affections increasing and multiplying—We have, as Americans, a morbid nervousness which is a new state of the system—Our increased nervousness evinced by the connection with, and influence of the nervous system on other diseases not properly nervous—Increased consumption of neurotic remedies in this country—The neurotic circle in society constantly increasing, out of proportion to the increase of population, equally with the distinctly insane circle of society, causes increased complexity of the central nervous system and of life—Probable elaboration in structure of the brain due to the demands of a modern civilization upon it—Modern system of education influential in the production of nervous and mental disorders of a grave type—Brain exhaustion and organic disease thus induced—The exhaustive effects of excessive and ill-directed brain work in our modern schools—The whole future complexion of mental life in great part determined by the impressions made on the sensory centres of the brain when they are undergoing development—The difficulty of making even cultured people understand that brain-tissue degenerations and mental diseases may be separated by long intervals of time from the too premature and intense stimulation of the brain which causes these nerve and brain diseases—Brain disease much increased in our period of civilization as compared with a former and more primitive period—By cautious stimulation of the brain we bring it to its highest development; by undue haste we ruin its functional activity forever—Wakefulness and restlessness to be met by promptly leaving one's business and taking complete physical and mental rest—Mental anxiety, by producing sleeplessness and unrefreshing sleep, quickly disturbs the normal balance of the nervous system and deranges its functions—Syphilitic nervous disease and its diagnosis, ... 311

CHAPTER XVIII.

GENERAL CONSIDERATIONS ON THE DEVELOPMENT OF THE NERVOUS SYSTEM BY EVOLUTION, AND THE CONDITION OF THE BRAIN IN HEALTH AND DISEASE, AND GENERAL REMARKS ON THE REGIONAL DIAGNOSIS OF DISEASES OF THE SPINAL CORD AND BRAIN.

The simplest nervous apparatus, one ganglion situated in the neighborhood of the mouth, in the mantle, and giving off cords which proceed to the sense and digestive organs of the *ascidian mollusc*—The *echinoidea*, the *annulosa*, having a chain of ganglia running the whole length of the body, united by nervous cords—The *insecta*, having two cords passing backwards from the cephalic

PAGE

above the ventral ganglia, and giving off branches to them and to the body walls—This the most rudimentary form of the cerebro-spinal system—The *vertebrata*—The *lancelet*, the vertebrate with the simplest nervous system—The renal axis of this animal, a delicate tract of nucleated cells, surrounded by a covering of pia mater, and fifty or sixty pairs of nerves given off laterally—*Lampreys* possess a higher organization, as they have a cartilaginous cranium, with a spinal cord extending anteriorly—The *cod* and *shark* higher yet; the posterior fissure widens, and the halves of the cord expand—Two lateral columns project into the ventricle from the conjoined restiform and posterior pyramidal tracts—Cerebellum and crura cerebelli added next in process of evolution, etc.—Crocodile—Bird—Dog—The cerebra develop *pari passu* with the animal's degree of intelligence—Multiplication of ganglia always accompanied by a corresponding differentiation of ganglionic functions, some being devoted to sight, others to controlling muscular tissue, etc.—The nervous system always adapted to the general structure of the animal—The pre-œsophageal ganglion of the annulosa the direct homologue of the vertebrate brain—In the highest vertebrates reflex movements take place through the brain, spinal cord, and sympathetic system—These govern the visceral functions, and are connected with the voluntary actions of life—In the evolution of the nervous system the brain or cephalic ganglion is gradually increased in motor and sensory power, and the non-cephalic ganglion relatively lessened, the nervous apparatus gradually gaining in complexity, until *man* is reached, where we find the nervous system comprising the cerebrum and cerebellum, with the various ganglia and commissures which belong to these bodies, the medulla oblongata, the spinal cord, the sympathetic ganglia, and the nerves which, springing from these several sources, are distributed throughout the organism, etc.—*General considerations on the diagnosis, pathology, and treatment of nervous diseases*—Generally, a perfect accord between the cortical lesion in the brain and the peripheral and functional lesion, and we find the same parallelism between the intensity of the lesion of movements and the gravity of the lesion in the cortical motor zone—From the region of the body where the convulsive movements commence in nervous disease, we may, with certainty, diagnosticate the cortical brain-centre primitively and principally affected, which will be that corresponding to the group of muscles earliest brought into action—Rules for localizing chronic lesions of the nervous centres—The appearance of synchronous and symmetrical paraplegia—Paraplegia of the legs—Cerebral paraplegia—Tabetic symptoms—Progressive muscular atrophy—Hemiplegia with opposite hemianæsthesia—Bilateral tabetic neuralgia of the legs and arms in central neuroses—Progressive paralysis of cerebral nerves—Paraplegia of the tongue (alalia)—Hemiplegia, with opposite facial or oculo-motorius paralysis—Hemiplegia, with hemianæsthesia of the same side—Hemiplegia, with incomplete facial paralysis (the upper branch remaining free)—Hemiplegia, with convulsions—Diseases of the meninges—Static vertigo—Contractions of central origin—Tremors—Influence of sensorial irritation upon phenomena due to motor irritation—Phenomena of motor irritation from centric causes—*The diagnosis of diseases of and injuries to the spinal cord*—Paralysis of voluntary movements, of the muscular sense, of the vaso-motor nerves, hyperæsthesia, ocular and facial symptoms on both sides of the body, anæsthesia in one lateral half of the body—We can make an exact diagnosis as to the seat of the lesion:

PAGE

Lesion in the *pons varolii*, lesions in the *crus cerebri*, lesions in the *optic thalamus*, lesion in corpus striatum, lateral ventricles, lesions in the anterior, middle, and posterior parts of the cerebral hemispheres—Symptoms of critical affections of the brain—Lesions of the cerebellum—Pathological diagnosis—Sudden hæmorrhages—Prognosis in cerebral hæmorrhages—To avert threatened cerebral hæmorrhages, ... 319

CHAPTER XIX.

DIPSOMANIA.

Dipsomania, a true periodical insanity, a form of physical disease—Differs from the physiological state in which the individual merely chooses to indulge in liquor to excess—The great diagnostic point of the disease, the *irresistible impulse*, by which the patient is impelled to gratify his morbid propensity, being, during the paroxysm, blind to all the higher emotions, and pursuing a course against which reason and conscience alike rebel—These paroxysms preceded by considerable disturbance of the nervous system, etc.—Treatment, judicious restraint—A permanent recovery depends on allowing sufficient time for restoration of the nerve-power, mental tone, and physical vigor, and for complete recuperation of the will-power, etc.—Nervous exhaustion and premature mental decay from dipsomania, and its treatment, etc., ... 354

CHAPTER XX.

HYSTERIA.

Causes, symptoms, pathology, diagnosis, prognosis, and treatment—Principal characteristics of hysteria consist in an exaggeration of involuntary motility, and a diminution of the power of the will—Voluntary movements not properly executed, while the reflex sensational and emotional movements are abnormally active—The will determined by the ideas, feelings, and fancies—The patient cares nothing for her duties, and takes pleasure in exaggerating all her slight discomforts and annoyances, and by her suspicious, exacting, and unreasonable behavior makes life generally uncomfortable to her friends—Hysterical patients must be unconsciously guided away from self, and into new grooves of thought, feeling, and action—Electricity, exercise, tonics, etc. and removal from home—The psychical treatment, *away from home*, of primary importance, . . . 376

CHAPTER XXI.

EPILEPSY.

Definition—Causes—Symptoms—Pathology—Diagnosis—Prognosis—Treatment, . 417

CHAPTER XXII.

HYSTERO-EPILEPSY.

Symptoms—Pathology—Diagnosis—Prognosis—Treatment—History of a very unusual case of hystero-epilepsy, with removal of both ovaries, ... 442

CHAPTER XXIII.

CHOREA.

PAGE

Symptoms—Causes—Pathology—Diagnosis — Prognosis and Treatment—Chorea occurs at a time when the nutrition of the brain is passing through a state of transition, from that of infancy or early childhood to that of the adult period—The lesion one of mal-nutrition and irritation—Treatment must be tonic and bracing to the nervous system, cold sponge baths, chalybeates, quinine, and other metallic tonics—A tendency in the worst cases to run into one or other of the inflammatory diseases of the brain and spinal cord—General unilateral tendency of chorea—Symptoms connected with a morbid irritability of the cerebral convolution, ganglion at the base of the brain, the pons, the medulla and the spinal cord—The disease depends upon hyperæmia and morbid irritability of the nervous centres—*Hereditary chorea*, ... 449

CHAPTER XXIV.

VERTIGO.

Definition—Causes—Varieties—Prognosis—Treatment, ... 462

CHAPTER XXV.

STATES OF UNCONSCIOUSNESS.

Somnambulism—Catalepsy—Trance and Trance Coma, ... 466

CHAPTER XXVI.

CEREBRAL AND SPINAL ANÆMIA.

Frequence among American women—A disease of capillary contraction and bloodlessness—Symptoms of cerebral irritation present—May be great disturbances of sensibility—If not checked, lapses into melancholia and dementia, ending in psychical torpidity and intellectual decay—The state of anæmia, if carried beyond a certain point, will destroy functional activity and the activity of the brain—Treatment—Psychical and medicinal—Electricity, etc., must improve quantity and quality of blood circulating in the brain and spinal cord, . . 490

CHAPTER XXVII.

INFLAMMATORY DISEASES OF THE BRAIN AND ITS MEMBRANES.

Periphery of brain very sensitive, and injuries of this portion attended with very serious results—Inflammation of membranes followed by formation of pus or effusion of serum or of lymph—Idiopathic encephalitis very rare—All external injuries to head of great importance owing to anatomical relationship between the pericranium and the dura mater—Stage of invasion and stage of effusion in meningitis—Rigors, pain in head, intolerance of light and noise, and irritability of temper—Symptoms—Differential diagnosis at onset of typhoid fever and delirium tremens, ... 496

CHAPTER XXVIII.

NEURALGIA.

PAGE

General considerations, varieties and treatment—*Pathology of neuralgia* consists in the functional impairment of the sensory nerve-cells of the central sensory tract of the nervous system which is the seat of nervous sensibility—In neuralgia of extremities we should search for trouble or injury to the trunk of the nerve whose sentient extremities are affected—Exit of the cranial nerves, neuritis and neuralgia—Visceral neuralgias—Hypodermics of atropia—Neuralgia sometimes dependent upon peripheral vaso-motor disturbance, but the *nerve-centres* generally the seat of the disease—Neurasthenia or nervous exhaustion the most important predisposing cause—Tendency of neurasthenia toward incipient insanity—Motor phenomena, loss of muscular power and endurance—The secreto-motor part of the nervous apparatus disturbed—Hemorrhoids, impacted fæces, and affections of the urinary organs causes of visceral neuralgias—Diseased ovaries—Exostoses in frontal sinuses or in the ethmoidal or sphenoidal bones, or on the roots of the teeth—Treatment—Professor Erb, of Heidelberg, on electricity as a therapeutic agent in neuralgia—Static electricity and continuous galvanic current, ... 501

CHAPTER XXIX.

LOCOMOTOR ATAXIA (POSTERIOR SPINAL SCLEROSIS) CEREBRAL HYPERÆMIA, CEREBRAL SOFTENING, AND CEREBRAL SCLEROSIS.

Description—Symptoms—Clinical history and treatment—Premonitory symptoms of posterior spinal sclerosis—Paroxysms of pain of a neuralgic character, wandering and of a stabbing, boring nature, generally in the feet and legs—Diminution of the patellar tendon, vesical, rectal, and pupillary reflexes, and plantar anæsthesia—*Crises gastriques* of Charcot—Osteo-arthritic changes—Treatment, ... 518

CHAPTER XXX.

ELECTRICITY IN DISEASES OF THE NERVOUS SYSTEM.

The Faradic current—The constant or galvanic current and static electricity—When indicated and how to be used—Dr. J. Russell Reynolds, Dr. A. D. Rockwell, Dr. Wilks, Dr. Poore, Dr. Buzzard, and Dr. Althaus, on clinical uses of electricity, ... 546

CHAPTER XXXI.

SPINAL CONCUSSION.

Viewed in a scientific, clinical, and forensic light—Effects as a rule remote rather than immediate—The mind affected quite as seriously as the body—Medico-legal relation and significance—The spinal cord may be functionally disturbed and even organically diseased from any and all such spinal shocks and injuries—Local and constitutional immediate and remote effects from these inju-

PAGE

ries—*Primary effects* due to molecular changes—*Secondary effects* of an inflammatory nature—The length of time that may elapse between the injury and the development of symptoms—Meningitis—Myelitis and meningo-myelitis—Necessarily fatal injuries to the spine from indirect violence—Variation in paralysis—Slowly developed spinal meningitis from spinal injury in railway collisions terminating in death eventually—Paraplegia and slow recovery—Injuries to the back without apparent mechanical lesion—Slight injuries followed by fatal results—Sensory disturbances—Nervous shock, no immediate effects and chronic meningitis with imperfect recovery—General shocks the result of railway collision, etc.—Treatment, ... 608

CHAPTER XXXII.

THE PSYCHOLOGY OF CRIME.

The degree of responsibility which attaches to the class who are periodically or constantly impelled to commit crime—A pathological state of the brain connected with a peculiar skull development (shortening of the occiput, anterior vertex steepness, "*scheitelsteilheit*," asymmetry, and flattening of occiput)—Professor Moriz. Benedikt's researches—The varieties of skull development which play a part in the natural history of crime—An anthropological change lies at the foundation of criminal propensities—A deficient organization lies at the base of criminal natures and is the cause of the abnormal moral constitution—Examination of four criminal brains by Professor Benedikt—Want of prominence of the external occipital protuberance and flatness of occiput—Vertex steepness (rising up from before backwards), present in 55 per cent. of habitual thieves' skulls—(The highest point of the crown generally stands a little higher, one and a half centimetre, than the boundary line between the part of the forehead covered with hair and that which is uncovered—The proportion is altered in habitual thieves, and there are differences amounting to seven centimetres—The frontal diameter at the top of the crown is broad, and broader than that of the forehead; and, lastly, the highest protuberance of the two parietal bones lies commonly in such an oblique horizontal line that one end of it lies before and the other behind the ear)—Murder often the result of ethical weakness or imbecility because the materials for the formation of the higher feelings are absent—Construction of the skull proportionate to the whole anthropological organization in animals and man—The ethic constitution or development is wanting which is necessary to the foundation of the feeling of what is right—There is a predisposition to crime as to insanity—The brain comes into the world with the same imperfections and deficiencies, the same irresistible tendencies to disease or perversity of action, which have long been observed with regard to other organs—Imperfection, deficiency or obliquity are the result of organic influences, and abnormal mental and moral phenomena result—The necessity for moral pathology to be raised to a science—An irresistible impulse to do or say a thing abhorrent to one's own idea of fitness or morals, significant of the inheritance of a tendency to mental disease—The mental responsibility of those with the peculiar cerebral condition which is produced by tendencies to disease or ancestral vices—The laws of hereditary transmission imperfectly understood—The conditions of mind implying abnormal imperfection of

PAGE

the brain very imperfectly studied and understood—Science claims recognition of the fact that the course of thought, the sense of moral distinction and conduct are greatly affected by congenital imperfections of the brain—Responsibility to depend on this fact—A family saturated with insanity will generally exhibit some criminal moral obliquity, frequently witnessed in abnormal mental states—Legal responsibility only to be ascertained by a thorough investigation of the circumstances of each individual case—A good physical education and sound mental discipline necessary to antagonize diseased tendencies, etc., ... 617

APPENDIX.

A.

An Abstract of the Laws Relating to the Care and Custody of the Insane in the various States of the Union. By William J. Mann, Esq., of the New York Bar, 631

B.

Form for Recording Cases of Insanity to Insure Uniformity of Statistics, . . 672

C.

Résumé of the Treatment of Insanity, ... 675

D.

Explanation of Frontispiece, ... 679

E.

Bibliography, ... 680

Index, ... 693

INTRODUCTION.

A PERFECT state of the organization of the nervous system and freedom from any pathological condition are required for the perfect performance of its functions. Any pathological state of the brain or spinal cord changes the normal function of the nervous system and produces disease.

The seat of the intellectual and emotional functions is in the convolutions of the cerebrum; the cerebellum and the central masses of gray matter being the seat of motion, which may be excited by the desires and by impressions upon the sensory and excito-motory nerves. The medullary substance of the brain is but a series of conducting fibres, and pathological conditions of the white substance in the cerebellum, the corpora striata and thalami frequently exist without affecting the mental functions. Such diseases will affect sensation and motion, but judgment, memory, and emotion will probably be left unaffected. Conversely, disease may be limited to portions of the brain which either conduct impressions to or from the brain, or which subserve the function of muscular activity. We may have cerebral paralysis without mental disease, although an effusion of blood in the white substance may produce loss of mental function when it at first takes place, from the pressure on the gray matter of the convolutions. The mental power soon returns, however, while paralysis of motion remains until the integrity of the injured brain-substance is restored. Pathological states of either the gray or white substance of the brain often extend from one to the other by continuity or sympathy, as they are so intimately connected, although differing in function.

The causes of diseases of the nervous system are like the causes of *all* diseases—predisposing and exciting. The first or predisposing cause comprises the conditions which so modify the health of a person as to predispose him to the acquisition of nervous diseases. They are: the influence of age, with the important physiological epochs that pertain to the different periods of life; difference in the organization of the sexes; personal peculiarities, comprising the influence of heredity, with its transmission of peculiarities, tastes, and tendencies to disease, such as insanity, epilepsy, hysteria, and neuralgia; occupa-

tion, habits of life, and effects of previous disease, which many times engender a liability to recurrence of the same or allied neuroses; and, finally, influence of climate and atmospheric changes and temperature. The second or exciting causes of nervous diseases may be divided into three classes—mechanical, chemical, and vital. 1st. May be mechanical, or pertaining to abnormalities in anatomical structure of the nervous system or interference with it, as thickening or contraction of bloodvessels by pressure on them or from obstructions in them; impediments to the transmission of nerve currents along the nerves; dilatations of arteries, and extravasations or effusions of the blood or serum. 2d. The chemical causes of nervous diseases include all that may be traced to the action of poisonous substances, whether derived from the inorganic or organic kingdoms: thus muscular tremors may indicate mercurialism; and dropped hand, lead poisoning. The effects of stimulants, narcotics, and tobacco are also included. The retention in the system of poisonous effete matter, owing to the defective action of the excretory organs, are among the most important of the chemical causes of nervous disease, and depend upon inefficient action of the kidneys, liver, lungs, and skin. The brain being so abundantly supplied with bloodvessels, is liable to all abnormal conditions which irregularity in the quantity or quality of the blood can occasion. It is exposed to the effects of anæmia and hyperæmia, the latter being sometimes accompanied by organizable or inorganizable exudates. If there is excess of carbonic acid or deficiency of oxygen in the blood circulating through the brain, it is immediately affected by it. The brain is also disturbed through sympathy by injuries of or poisonous influences applied to the peripheral portions of the nervous system. 3d. The *vital* causes of nervous diseases are those which implant themselves in our bodies, and grow and multiply, producing certain characteristic symptoms. They may be palpable, actual, living objects, as parasitic animals and vegetables, or they may be the infectious matters to which the exanthematous fevers are due; or the poison of malaria, on which ague and intermittent fever depend, which closely resembles the contagia of fever. The nervous system is especially liable to disease, as its supreme controlling centre, the brain, is liable to conditions of exhaustion to a greater extent than any other organ of the body. The overtasked brain cannot, as can other organs, gradually gain an increase of power to perform its task, but if tasked to such a state of exertion, by any cause or set of causes, that such exertion fails to be

followed by sleep, rapid exhaustion follows, with excitement of, and perhaps irregular and disproportionate activity of its functions. The brain-cells derive nutritive renovation from the blood principally or entirely during sleep, and anything that directly interferes with the uniform and healthy interchange of nutritive plasma passing from the vessels to the cells, and of the fluid cell-contents in a state of involution or degenerative metamorphosis passing from the cells to the vessels, deranges the intimate connection between the nervous and vascular systems through which their most important functions are performed, producing at once grave disturbances of the nervous system, which may eventuate in insanity. The elementary disturbances of the cerebral functions which we meet with in our clinical studies in psychiatry, involve processes in the emotional sphere; processes in the sphere of the conceptions, comprising the reason, memory, and phantasy; and, finally, processes in the psycho-motor sphere, the impulses, and the will. Among *emotional* disturbances we find the two extremes of morbid depression and morbid exaltation, and also the conditions of abnormal excitability and abnormal absence of emotion. The morbid processes in the *conceptional* sphere involve and affect the duration, association, intensity, and reproduction of conceptions, and also comprise the delusions of the insane, or false conceptions. The morbid processes met with in the psycho-motor sphere cause the morbid desire for food characterizing the insane and the refusal of food by melancholiacs; affections of the sexual propensities, either loss or abnormal excitation; the various morbid impulses associated with insanity; also, disturbances in speech. We have elementary disturbances of consciousness in diseases of the mind, such as epileptic states, ecstasy, somnambulism, various states of altered consciousness, and the bewildered state of the mind in paralytic dementia. We have also sensory disturbances, as anæsthesia and hyperæsthesia; motor disturbances; vaso-motor disturbances, such as cerebral anæmia, cerebral hyperæmia, venous stasis, and œdema of the cortex, and a great many changes in arterial tension, resulting in sudden cardiac disturbances in the insane. We have also trophic disturbances, such as the herpes and rhagades of melancholiacs and patients with dementia; abnormal pigmentations, etc. We find also many anomalies of the vital functions—the temperature, the pulse, digestion, assimilation, respiration, general nutrition, and sleep.

As psychiatry is the broadest field of medicine, and is beginning

to attract general medical attention, and as we must look to the general practitioners for practical aid in stemming the great and growing tide of insanity, and depend upon their intelligent efforts to avert it through the prevention of hereditary transmission, which threatens family deterioration, this book is presented to them in the belief that it will be acceptable to them. The general or family physician is interested in the early recognition and repression of the first sign of mental disorder, and he is to be the psychological physician of the near future.

To the authors of those works quoted or to which I have referred, and to many miscellaneous writers whose writings have been of service to me, I acknowledge my indebtedness, and especially to Maudsley, J. Russell Reynolds, J. Hughlings Jackson, Drs. Ramskill, Charcot, Bastian, Duchenne, Skey, Radcliffe, Begbie, Trousseau, Niemeyer, Bristowe, Bouchard, Romberg, Lancereaux, Moreau, Goebel, Brown-Séquard, Wilks, Broadbent, Kirkes, Rilliet et Barthez, Durand-Fardel, Todd, Doussin, Maisonneuve, Pritchard, Falret, Briquet, Landouzy, Bucknill and Tuke, Parchappe, Griesinger, Clouston, Leidesdorf, Griffin, Valleix and Remak, Krafft-Ebing, Esquirol, and Ray.

Respecting the medical treatment of insanity in our public institutions, I would say that I deem the great necessity of the day to be for greater individual consideration, special treatment, and remedial care of the insane.

The theory that the course of insanity is scarcely ever arrested or shortened ought to date its death-blow from 1852, when the eminent Dr. Forbes Winslow, of London, England, wrote as follows:

> It is a lamentable error to suppose—and a dangerous, a false, and unhappy doctrine to promulgate—that the disordered affections of the mind are not amenable to the recognized principles of medical science. I again declare it to be my positive and deliberately formed opinion that there are few diseases of equal magnitude so susceptible of successful medical treatment in the incipient form as those implicating the normal action of thought. The vast amount of incurable cases of insanity which crowd the wards of our national and private asylums is pregnant with important truths. In the history of these unhappy persons—these lost and ruined minds—we read recorded the sad, melancholy, and lamentable results of either a total neglect of all efficient curative treatment at a period when it might have arrested the onward advance of the cerebral mischief and maintained reason upon her seat, or of the use of injudicious and unjustifiable measures under mistaken notions of the nature and pathology of the disease. In no class of affections is it so imperatively necessary to inculcate the importance of early and prompt treatment as in the disorders of the brain affecting the manifestations of the mind. I cannot close my eyes to the fatal consequences which have so often ensued from a belief in the incurability of insanity by medical means. In all grades of society we witness the pernicious, the fatal, the disastrous effects of this dogma, etç., etc.

PSYCHOLOGICAL MEDICINE.

CHAPTER I.

HISTORY AND CLASSIFICATION OF INSANITY.

THE earliest mention made of insanity is about 1451 B.C., when Moses declares to the children of Israel that if they disobey the law given to them they will be smitten with madness. David's feigned insanity occurred about the year 1062 B.C. He evidently simulated dementia to exempt him from punishment at the hands of Achish. Ulysses, 1184 B.C., feigned madness to escape service in the Trojan war. Euripides, in his writings, alludes to the power of the god Bacchus to produce madness. Cambyses was looked upon as insane before his devastation of Egypt, during which time he plunged his dagger in the sacred bull Apis, for which sacrilege he was divested of all reason. Nebuchadnezzar, the great Babylonian king, was insane, and left the haunts of men, leading the life of a beast,—a form of madness called lycanthropy. The ancients from their descriptions were acquainted with insanity, and the earlier Greek historians make mention of it as affecting the Greek mythological personages. Thus Ajax killed all the sheep in the camp, under the delusion that they were enemies, and favored the cause of his rival Ulysses. Upon recovering his reason he committed suicide through mortification at what he had done. Even Hercules was said to suffer from insanity. Juvenal, 300 years B.C., mentions hellebore in his writings as the specific in insanity, and it was by this remedy that Melampus is said to have cured the three daughters of Proetus, who became insane through failure to worship the god Bacchus. The heathen philosophers believed that the devil took up his abode in the soul, and that the insane person became thus possessed. They believed that he forced an entrance into the soul from without the body. Although in the New Testament we find accounts of insanity, possession of the devil was regarded as synonymous with lunacy. In Matthew 4 : 24,

the Apostle distinctly says that they brought to Christ, those who were lunatic and those who had the palsy; and he healed them. From the earliest period in the history of medicine mental diseases have been recognized, more or less classified, and treated as a rule as worthy of the utmost attention that science and humanity could dictate. As far back as the days of Hippocrates, insanity was recognized as appearing under different forms and conditions of mind.

Hippocrates, in writing of insanity, mentioned three states in which mental disease was manifested: mania, melancholia, and dementia. Celsus also recognized three kinds of insanity. The old Roman laws divided the insane into two classes: *furiosi*, those who were violent and maniacal; and *mente capti*, those who were suffering from dementia, or weakness of intellect. The ancient writers, although very crude in their ideas of insanity, recognized as a rule the different mental states accompanying mania, melancholia, and dementia. Different writers in modern times have attempted various methods of classification, but the simple and yet comprehensive one of Pinel has really been the foundation-stone on which all succeeding writers have reared their modern systems of classification. The classification just alluded to includes the four great primary mental states or conditions of insanity, namely: mania, melancholia, dementia, and idiocy. As most writers on insanity prefer to enlarge on such simple classifications and elaborate them somewhat, the question arises, what are the best grounds on which to found our classification? This question has been ably answered by many writers. The ætiology or causes of insanity has been made the basis of two very excellent classifications, the first by Dr. Morel in his *Traité des Maladies Mentales*, published in 1860, and the second, a later and more elaborate one, by Dr. Skae. The International Congress of Alienists, at their meeting in Paris, in 1867, adopted a combination of the ætiological and symptomatological methods under seven heads: 1. Simple insanity. 2. Epileptic insanity. 3. Paralytic insanity. 4. Senile dementia. 5. Organic dementia. 6. Idiocy. 7. Cretinism. Drs. Bucknill and Tuke, in their *Manual of Psychological Medicine*, have adopted a combination of the symptomatological and psychological method of classification. They have divided it under five heads or divisions, as follows:

I. Idiocy, imbecility, and cretinism; states of undeveloped intellectual power.

II. Dementia; a state in which the intellectual power has been destroyed.

III. Delusional insanity; under which head they embrace all the states in which marked delusions are present—melancholia, with delusions; monomania, with delusions; and homicidal and suicidal insanity, with delusions.

IV. Emotional insanity, or morbid states of the emotions without delusion, whether attended by melancholia or excitement.

V. Mania. In conclusion it is remarked that "all these forms or varieties of insanity are liable to complication with epilepsy, or, if acquired, with general paralysis."

In moral and intellectual idiocy, and imbecility, and cretinism, we find an absence or arrest of the development of the intellectual and moral faculties, while cretinism is characterized also by a characteristic vicious conformation of the body—an arrest of development of both body and brain alike.

We have mania from many causes. We find hysterical mania, amenorrhœal mania, puerperal mania, the mania of pregnancy and of lactation; climacteric mania, occurring at the change of life; mania due to ovarian or uterine disease; senile mania; phthisical mania; metastatic mania; traumatic mania; syphilitic mania; delirium tremens, and dipsomania; together with the distinct mania of alcoholism, mania after fevers, mania depending upon oxaluria and phosphaturia, general paralysis with mania, and idiopathic mania. These different forms of mania do not necessarily have their own special psychological character, because, for instance, in puerperal insanity we may find in one case melancholia as the mental state, and in another case mania. It is important in studying mental disorders—in treating them, also—to look to the bodily origin of the disease and remove the morbid condition upon which the insanity often entirely depends. We must be careful, however, not to ignore psychical causes of insanity, as mania has frequently an emotional as well as a physical cause.

Metaphysically speaking, 1st. Insanity affects the intellect or the ideas; 2d. The feelings and moral sentiments; and 3d. The propensities or instincts.

Among the curable forms of insanity we have the insanity of pregnancy, insanity of childbirth, insanity of lactation, climacteric insanity, insanity from uterine disorder, insanity from tuberculosis (?), insanity

from masturbation, insanity from alcoholism, delirium tremens, dipsomania, hysterical insanity, and post-febrile insanity.

The forms of insanity generally styled incurable include paralytic insanity, epileptic insanity, senile dementia, and organic dementia. Dr. Auguste Voison, however, takes an altogether more hopeful view than is held by the profession generally of the curability of *general paralysis*, even in confirmed cases, and reports ten cures on record where there could be no doubt of the diagnosis.

In treating of the pathology and therapeutics of cerebral disease, we may, I think, advantageously combine a method alike adapted to the student of medicine and to the general practitioner, combining a classification which, although it is artificial, aims at presenting to the view a series of mental pictures displaying certain types or forms of disease and such canons of treatment as may remain in the memory and constitute starting-points for subsequent illustration and investigation, with a mode based on clinical experience, which, even though it fails perhaps to corroborate the dicta of nosologists, is equally valuable.

I have aimed to teach the necessity of examining carefully every case as it arises, and not to accept blindly and bind the mind down to any preconceived ideas derived from the authority of books, however well written. My experience in the treatment of diseases of the mind and nervous system has convinced me of the fallacy of almost all our attempts to establish unerring principles of nosological arrangement or to establish dogmatic principles of treatment. For the student of mental disease who desires to study a classification of insanity, I present the classification of one of the most eminent teachers of clinical psychiatry in Germany, and one of the most eminent of the new school of German alienists, Professor Krafft-Ebing.

His fundamental classification of the insanities is into the psychoneuroses and the psychical degenerative states, and to this he adds, as equivalent groups, the cerebral diseases associated with predominating psychical symptoms and the conditions of arrested development.

Classification of Insanity.

The Psycho-neuroses.

I. Primary curable forms.

A. *Melancholia.*

1. Melancholia.
2. Melancholia attonita.

B. *Mania.*
1. Simple maniacal excitement.
2. High maniacal exaltation, with great motor excitement and often with furor.

C. Primary dementia (*Stupiditæt*).

II. Secondary incurable conditions of psychical weakness.

A. Chronic mania, with a loss of power of creating systematic delusions, found as a sequel of uncured primary forms (*Secundære verrueecktheit*).

B. Terminal dementia.
1. Dementia, with excitement and confusion.
2. Apathetic dementia.

The Psychical Degenerative States.

A. Constitutional affective insanity (*Folie Raissonnante*).

B. Moral insanity.

C. The monomanies, or *Folie systematisée* (*Primære Verrueecktheit*).
1. With delusions.
a. Of persecution.
b. Megalomania.
a. m. Religiosa.
b. m. Erotica.
2. With imperative conceptions (*Zwangsvorstellungen*).

D. Epileptic insanity.
1. The psychical degenerations of epileptics, or ep. dementia.
2. The transitory epileptic psychical disturbances which precede, or follow, or take the place of convulsions.
a. Epileptic stupor.
b. States of imperfect and dazed consciousness.
a. With fright (*petit mal intellectual*).
b. With frightful deliria and hallucinations (*grand mal intellectual*).
c. With religiously expansive deliria.
d. Dreamy stupor.
e. Dreamy stupor, with excitement.
3. The epileptic psychoses.

E. Hysterical insanity.
1. Transitory forms.
a. With fright.
b. Hystero-epileptic deliria.

c. Ecstatic visionary forms.
d. Moria-like conditions.

2. Chronic forms.
a. Hystero-melancholia.
b. Hystero-mania.
c. Degenerative states, with hysterical basis.

F. Hypochondriacal insanity.

G. Periodical insanity.

I. *Of idiopathic origin.*

1. In the guise of a psycho-neurosis.
a. Mania periodica.
b. Dipsomania.
c. Melancholia periodica.
d. Circular insanity.

2. In the guise of delirium.

II. *Of sympathetic origin.*

a. Periodical insanity of menstruation.

The Cerebral Diseases with Predominating Psychical Symptoms.

A. Dementia paralytica (*Progressive paresis*).

B. Cerebral syphilis.

C. Chronic alcoholism and its complications.

1. Delirium tremens.
2. Pathological intoxications (*mania a potu*).
3. Hallucinatory conditions.
4. The alcoholic psychoses.
a. Mania gravis potatorum.
b. Alcoholic melancholia.
c. Alcoholic insanity, with delusions of persecution.
d. Alcoholic paralysis.
5. Alcoholic epilepsy.

D. Senile dementia.

E. Acute delirium (*Congestive mania and typho-mania*).

The Psychical States of Arrested Development—Idiocy and Cretinism.

It should be understood that the psycho-neuroses are those insanities which attack an intact brain, and the psychical degenerative states are those affecting the brain injured by hereditary or acquired vices of conformation or mal-nutrition.

In our examination and study of cases of insanity we may with advantage take up,

1. Anthropometry, or study of the cranium.

2. The face: physiognomy, breadth of forehead, shape of ears.

3. The trunk: shape of thorax, muscular development, amount of adipose tissue.

4. Upper limbs: comparison, abnormal states, etc.

5. Lower limbs: size of muscles and symmetry.

6. Psychical functions: ideation; memory; language, whether defective or not; neatness of pronunciation.

7. Functions of relation: sensibility—tactile, dolorific, and thermal, electric sensibility; the special senses; mobility of pupils; paresis or paralysis.

8. Vegetative functions, whether normally performed.

9. Examination of urine.

In making autopsies in cases of insanity, we should examine,

1. Cranium: the bony case, whether thick or thin. Diploe; longitudinal suture, whether straight, or turning to right or left.

2. Cerebrum: conformation and development of hemispheres, whether alike in size. Dura mater and pia mater, whether adherent to hemispheres. Vessels of the pia mater, whether injected beyond normal. Convolutions, whether developed sufficiently, particularly the ascending parietal and the ascending frontal. In epilepsy the most internal part of the ascending parietal has been found to be atrophied and indurated to cartilaginous consistence as far as its embrochure in the fissure of Sylvius; also, the ascending frontal and foot of the third frontal. Base of the cerebrum: open lateral ventricles and examine thalami optici and corpora striata. Weight of hemispheres.

3. Mesocephalon: cerebral peduncles, pons, medulla, hemispheres of cerebellum.

4. Medulla spinalis: comparison of two halves.

5. Thorax; lungs; bronchi; heart, aortic walls for atheroma; valves of heart.

6. Abdomen; liver, size, consistence, anæmic or congested, etc.; spleen, size and consistence; kidneys, size, glomeruli and pyramidal substance; gastro-intestinal tract.

7. Microscopic examination of brain.

Definitions of Insanity.—It is almost impossible to give a good definition of insanity. Many have endeavored to do so, but none of

them have as yet succeeded. Locke said that "madmen do not appear to have lost the faculty of reasoning, but having joined together some ideas very strongly, they mistake them for truths and err as men do who argue from wrong principles."

Cullen called insanity a "lesion of the intellectual faculties without pyrexia and without coma."

Dr. Combs's definition of insanity, was, that "it is a prolonged departure, and without an adequate external cause, from the state of feeling and modes of thinking usual to the individual who is in health, that is the true feature of disorder of mind." He also speaks of insanity as "a morbid action in one, in several, or in the whole of the cerebral organs, and, as its necessary consequence, functional derangement in one, in several, or in the whole of the mental faculties which these organs subserve."

Dr. Conolly says: "Insanity is an impairment of one or more of the faculties of the mind, accompanied with or inducing a defect in the comparing faculty."

Guislain says: "Insanity is a derangement of the mental faculties —morbid, apyrexial, and chronic—which deprives man of the power of thinking and acting freely as regards his happiness, preservation, and responsibility."

Morel says: "Insanity is a cerebral affection, idiopathic or sympathetic, destroying the individual's moral liberty and constituting a derangement of his acts, tendencies, and sentiments, as well as a general or partial disorder in his ideas."

Dr. Bucknill says: "Insanity is a condition of the mind in which a false action of conception or judgment, a defective power of the will, or an uncontrollable violence of the emotions and instincts have separately or conjointly been produced by disease."

It is very much easier to describe than to define insanity. A fair medico-legal definition may be found, however, I think, in the following: Insanity is a disease of the body affecting the mind by deranging its faculties and causing such suspension or impairment of the action of the healthy *intellect*, *emotions*, or the will, as to render the individual irresponsible.

Ancient and Modern Classifications.—It is understood that Hippocrates recognized mania, melancholia, and dementia, although he did not classify insanity in this manner.

Celsus recognized phrenitis, accompanied by fever, as one form of insanity; second, mental disturbances without fever, characterized

by melancholy and caused by black bile; and third, a form which he separated in two subdivisions, "for some err in having false images, and not in their whole mind, as Ajax and Orestes are represented in poetic fables; in others, the whole mind or judgment is affected."

Aretæus recognized mania, melancholia, and dementia, but considered melancholia as only the initial stage of mania.

Cælius Aurelianus recognized mania and melancholia as the two forms of insanity.

Galen classified insanity into amentia, imbecility, mania, and melancholia.

Sauvages, in 1763, wrote on the "*vesaniæ*," which he subdivided into the *hallucinationes*, *morositates*, and *deliria*.

Linnæus, in 1763, wrote on the "*mentales*," and psychologically divided them into the three classes of the *ideales*, *imaginarii*, and *pathetici*.

Vogel, in 1764, recognized mania, melancholia, and amentia.

Cullen placed insanity in the class *Neuroses* and under the order *Vesaniæ*. His four great divisions were amentia, melancholia, mania, and oneirodinia. This last division included somnambulism and nightmare.

Dr. Arnold, in 1782, divided insanity into *ideal*, *notional*, and *pathetic* insanity.

Crichton, in 1798, adopted Cullen's method of placing mental diseases in the class *Neuroses* and under the order *Vesaniæ*, and divided the latter into *delirium*, *hallucinatio*, and *amentia*.

Mason Good made the order *Phrenetica*, in the class *Neurotica*, and subdivided it into *ecphronia* (mania and melancholia), *empathema* (ungovernable passion), *alusia* (illusion), *aphelexia* (reverie), *paronina* (sleep disturbance), and *moria* (fatuity).

Pinel divided insanity symptomatologically under the four divisions of mania, melancholia, dementia, and idiotism. He used the term idiotism as indicating an advanced dementia.

Esquirol, the pupil of Pinel, thus divides and classifies insanity:

"1. *Lypemania* (melancholy of the ancients): disorder of the faculties with respect to one or a small number of objects, with predominance of a sorrowful and depressing passion.

"2. Monomania: in which the disorder of the faculties is limited to one or a small number of objects, with excitement and predominance of a gay and expansive passion.

"3. Mania: in which the delirium extends to all kinds of objects and is accompanied by excitement.

"4. Dementia: in which the insensate utter folly, because the organs of thought have lost their energy and the strength requisite for their functions.

"5. Imbecility or idiocy: in which the conformation of the organs has never been such that those who are thus afflicted can reason justly."

Guislain classified insanity as follows:

Phrenalgia or melancholy; phrenoplexia or ecstasy; hyperphrenia or mania; paraphrenia or folly; ideophrenia or delirium; aphrenia or dementia.

Dr. Conolly writes of insanity under Pinel's heads of mania, melancholia, dementia, and idiocy, etc., and says that insanity is dependent upon "a state of increased, or diminished, or unequal excitement of the nervous system."

Professor Laycock makes a physiological classification, and his principle is that the order of morbid phenomena of insanity is similar and identical with that of healthy phenomena modified, and pathological facts should be classified in the same way as the physiological. He wrote, therefore, on disease of "(1) The encephalic centres subservient to the instincts and animal propensities, *i. e.*, the medulla oblongata, cerebellum, and posterior lobes of hemispheres; (2) Those centres subservient to the emotions and sentiments, *i. e.*, the ideagenic or sensorial substance of the cerebellum and hemispheres; and (3) Those subservient to the knowing and representative faculties (intellect), *i. e.*, the nerves of the senses, their ganglia, and the ideational centres in the cerebral (and cerebellar?) hemispheres. Imbecility, melancholia, mania, etc., characterize defective or morbid states of the structure, and therefore of the function of the localities mentioned."*

M. Parchappe's classification of insanity was founded on pathology

* Bucknill and Tuke suggest that if physiological and psychological functions of the brain are only different aspects of the same anatomical substrata, we might classify mental disorders in two great divisions, *Sensory Psychoses* and *Motor Psychoses*. The former including all forms of insanity in which feeling and emotion and the power of sensory perception and ideation are more particularly involved (hallucinations and conduct determined thereby), the posterior parts of the brain being the centres; while the *Motor Psychoses* would comprise those forms in which the higher intellectual faculties are affected as also motor power, the anterior lobes, here, being in all probability the centres.

alone, as follows: Monomania, acute mania, acute melancholia, insanity with paralysis, insanity with epilepsy, and chronic insanity.

M. Aug. Voison classifies insanity also on a pathological basis.

Among the German alienists, Heinroth, Ideler, and Hoffbauer classify insanity psychically, while others classify it somatically.*

Dr. Pritchard classified insanity psychologically, and divided mental disorders into two great groups. The first embraced moral insanity, or pathomania; the second, intellectual insanity, comprising monomania, mania, incoherence, or dementia.

Dr. Noble and Dr. Henry Mones adopted a classification of insanity, ranging it in three classes—emotional, notional, and intelligential.

Griesinger wrote on the basis of psychology, and made two great divisions—Emotional and Intellectual disorders, and associated the will under the last head. Three states were recognized,—the state of mental depression, or melancholia; the state of mental exaltation; and the state of mental weakness. Under the first state Griesinger put hypochondriasis, simple melancholia, melancholia with stupor, melancholia with destructive tendencies, melancholia with persistent excitement of the will; under the second state, mania and monomania; and under the third state, chronic mania, dementia, idiocy, and cretinism. Also disorders of sensation and sensations of movement were treated of.

Dr. Maudsley's mode of classifying insanity was formerly to distinguish the two great classes of intellectual or ideational, and the emotional or affective. Under the first head he placed mania, melancholia, monomania, dementia, general paralysis, idiocy, and imbecility; under the second head he placed maniacal perversion of the affective life or mania sine delirio, melancholic depression without delusion (simple melancholia), and moral alienation proper, in close contiguity to which is the insane neurosis of some families. More lately, however, we believe he has adopted Dr. Skae's classification, founded upon causes. Dr. Skae's classification is as follows—Dr. Clouston, by the way, designates it as a system founded upon the principle of "the exclusion of everything mental or psychical connected with insanity." The first group in this classification is Moral and Intellectual Idiocy and Imbecility; the second is Epileptic Insanity; the third, Insanity of Masturbation; the fourth, of Pubescence.

* Max. Jacobi, Hasse and Friedrich.

Then follow:

Hysterical mania.
Amenorrhœal mania.
Post-connubial mania.
Puerperal mania.
Mania of pregnancy.
Mania of lactation.
Climacteric mania.
Ovario mania (utero mania).
Senile mania.
Phthisical mania.
Metastatic mania.
Traumatic mania.
Syphilitic mania.
Delirium tremens.
Dipsomania.
Mania of alcoholism.
Post-febrile mania.
Mania of oxaluria and phosphaturia.
General paralysis, with insanity.
Epidemic mania.
Idiopathic { Sthenic, Asthenic.

Dr. Skae was right in this classification in so far that he recognized that insanity exists only as the result of disease, either functional or organic, in some part of the human body; but he was wrong in that he claimed that each of these groups presented psychological features peculiar to and characteristic of it, and he was also wrong in ignoring the psychical or emotional causes of insanity, which I consider very numerous, and which act with great virulence on a brain at all weak in its natural development or in one in whose family insanity, epilepsy, or consumption is to be found, *i. e.*, in a brain not perfectly intact, but injured by a hereditary vice of nutrition. If Dr. Skae had added a group of psychical or emotional insanity, and had omitted the claim of "psychological lineaments" for each group, he would have given psychologists a strong classification. As it is, he has not.* We cannot ignore psychic causes in

* As we naturally take the full history of every patient into account, as well as the existing mental symptoms, I think Dr. Skae's classification practically useful, as it directs our attention to the bodily cause of the patient's insanity which it must be our aim to

the classification of insanity. One great predisposing cause of insanity is the insane diathesis, so that a comparatively slight exciting cause will precipitate mental disease upon such a person. The insane diathesis itself is not a *disease*, but rather the existence of the constitutional tendency to it. We can recognize this neurotic diathesis, Dr. Anstie tells us,

"1. By the premature occurrence of puberty. Sexual precocity.

"2. By the unexpected development of intense artistic feeling in children born of a naturally commonplace family.

"3. Convulsions during teething without adequate cause.

"4. The development of a habit of lying and stealing in well-trained children."

Dr. Anstie thinks that an active hereditary insane neurosis always originates in a family stock from either drink, sexual excesses, habitual want, or from mental vacuity from entire want of education.

In Bucknill and Tuke's *Manual of Psychological Medicine* both Dr. Tuke and Dr. Bucknill give their own classifications. Dr. Tuke gives two, the first a classification on a metaphysical basis, embracing three great classes: 1. The intellect or the ideas (intellectual insanity); 2. The feelings and the moral sentiments; and 3. The propensities (or will), instincts, or desires, the two latter classes coming under the general head of emotional and volitional insanity. The second classification is one from a somato-ætiological point of view, and this Tuke prefers himself as the more practical working classification. He says that "under the first division of the following list of forms of insanity we ought, therefore, to recognize a number of important cases which arise from excessive action or otherwise of the mental functions themselves, the brain being injured thereby. We might, perhaps, comprise this class in the general term, 'psycho-cerebral insanity,' or psychic insanity. Under this head would come acute dementia induced by mental shock, as fright; insanity induced by excessive study," etc. The following is the classification:

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remove. We can then investigate as to whether disease has attacked an *intact brain* or one predisposed to insanity by reason of *inherited* or *acquired vices* of *nutrition* or *conformation*, and finally investigate the psychical state, and by observing the state of mental *exaltation*, *depression* or *weakness* in our patient, diagnose the case as one of *melancholia*, *mania* or dementia, or idiocy, as the case may be. We have to consider *the indications presented in each individual constitution*. We must know the present state of the patient's mind, homicidal or suicidal, etc., and as the result of some practical experience the author of this work does not adopt any one classification exclusively, and does not recommend the general practitioner, for whom this work is especially intended, to do so. It is practically impossible.

I. *Insanity or Mental Deficiency caused by Primary Disease or Defective Development of the Encephalic Centres* (*Protopathic Insanity*).

1. Congenital or infantile deficiency.
2. Traumatic insanity.
3. General paresis.
4. Paralytic insanity (insanity with ordinary paralysis).
5. Epileptic insanity (when of central origin).
6. Senile insanity (insanity from old age).

II. *Insanity caused by Disorder of, or Developmental Changes occurring in other Organs than the Encephalic Centres* (*Deuteropathic Insanity*).

7. Pubescent insanity.
8. Masturbatic insanity.
9. Uterine and ovarian insanity (in early or later life).
10. Hysterical insanity.
11. Insanity of gestation or pregnancy.
12. Puerperal insanity (proper).
13. Insanity of lactation.
14. Climacteric insanity.
15. Intestinal, vesical, and hepatic insanity.
16. Post-febrile insanity.
17. Rheumatic and choreic insanity. Gouty insanity?
18. Tubercular insanity.
19. Syphilitic insanity.

III. *Insanity caused by Alcohol and other Poisons* (*Toxic Insanity*).

20. Alcoholic insanity.
21. Pellagrous insanity.
22. Cretinism.

"Insanity may be epidemic. With any of the foregoing may be associated, as a predisposing cause, the insane diathesis."

The above classification of mental disorders from the purely somato-ætiological point of view is very excellent. It is an approach to an anatomo-pathological classification, but perhaps lacks the psychological method. It is, however, in strict conformity with the somatic school of German psychology represented by Max Jacobi, Nasse, and Friedrich.

Clinically, when we have a case of insanity to deal with we natu-

rally ask first, with a view to the patient's probable course: Has the mental disorder attacked an intact brain or not? or, is it a brain whose conformation and nutrition were probably *defective?* Then we naturally search for a cause, which may be purely psychic in the first instance, or which may depend on disease of a functional or organic character in some part of the body, which, acting on the brain, has produced either congestion or anæmia of that organ which ministers to the manifestations of mind. Then we want to know the psychical state of our patient, to ascertain whether he will be dangerous to himself and others. Has he mental depression or melancholia, mental exaltation, or mania, or monomania, or has he mental weakness? We are desirous to be perfectly informed about all this. Then we want to know whether the intellect or the ideas, the feelings and the moral sentiments, or, finally, the propensities, instincts, or desires are principally affected. We see, therefore, that for clinical purposes, which, after all, are the most important, we need in a working classification, a combination of pathological, psychological, symptomatological, and ætiological systems which it is next to impossible to attain in any one system of classification, however good it may be. The various authors of these different classifications all deserve the greatest respect and credit for their laborious exertions in behalf of practical psychiatry. The physiologist will say: "I regard insanity as divisible from my standpoint according as it arises from disease of the *cerebral hemispheres* alone, as we see in idiocy, imbecility, dementia, etc., or from diseases combined with disorder of the *sensory ganglia* or *nerves*, as exhibited in hallucinations and illusions, or from such defect or disorder combined with disturbances of the *motor ganglia,* indicated either by their excessive action, as in mania, or by their depression and disorganization, as in general paralysis, or complicated with an affection of the *sympathetic* or *vaso-motor* system and marked by vascular disturbance." From his standpoint he is quite right. My metaphysical friend says: "Insanity affects the intellect, the emotions, or the will, and I can always put cases, according to their prominent character, under one or other of these heads." Very true; if you are an experienced psychiatric physician, you probably can.

The psychologist says: "All insanity can be classified under intellectual and emotional heads and under the psychical states of depression, exaltation, or mental weakness." He is quite correct, also. The somato-ætiological physician says: "Every case of insanity has

its physical cause, and I put every case under its special cause." Quite correct, if you can verify it. The pathologist says: "All insanity can be grouped under the heads of arrested or impaired development of the brain—idiophrenic, sympathetic, anæmic, diabetic, toxic and metastatic, phrenitic, enteric, rheumatic, and pellagrous insanity." These views are certainly sound from a pathological standpoint. Dr. Schrœder van der Kolk says: "All insanity is either idiopathic or sympathetic." He is certainly correct. All are right, and yet none of them, when taken singly and alone, makes a complete and exhaustive classification of insanity.

Dr. Bucknill has a very good, although complicated, classification, consisting of the combination of psychical characters or phenomena with pathogenetic relations and pathological conditions, the first forming the classes; the second, the orders and genera; and the third, the species.

The *classes* of psychical phenomena include melancholia, mania, and dementia, with sub-classes of psychical combinations and transmutations.

The *orders* of pathogenetic relations include simple, allied, sequential, concurrent, egressing, metastatic, and climacteric insanity.

The *genera* of pathogenetic relations comprises the subdivisions of the *orders*. The *species* of pathological conditions differentiating the genera by pathological conditions of the brain and nerves, of the blood and the nutrition, he divides into neurotic, hæmic, and trophic, with appropriate subdivisions.

CHAPTER II.

ÆTIOLOGY OF INSANITY AND THE IMPORTANCE OF ITS EARLY RECOGNITION AND REPRESSION IN THE INCIPIENT STAGE.

INSANITY grows out of a violation of those physical, mental and moral laws which, properly understood and obeyed, result not only in the highest development of the race, but the highest type of civilization. During the past twenty years there has been a decided increase of insanity in our country, disproportionate to the increase of population. The increase of insanity over that of population amounts to about

12 per cent. In the foreign element, this is due to marked changes in habits of living, the changes in food, increased intemperance, working more indoors, living in badly ventilated tenements, disappointment in not succeeding in business, etc., as they had expected to do in America, all of which causes combined tend to impair health, break down the nervous system, and tend insensibly toward insanity in the offspring. Respecting increased intemperance as a cause of insanity, the 34th annual report of the Crichton Royal Institution shows a rapid increase in insanity from drink as follows: 1869, 8 per cent.; 1870, 16 per cent.; 1871, 23 per cent.; 1872, 29 per cent.; 1873, 35 per cent. Dr. Gilchrist remarks that "doubtless a more minute analysis would largely increase the proportion of those in which the excessive use of stimulants, by the patients themselves or by their parents, constitutes an important if not the primary factor in the production of mental disturbance." Casper said that one-third of all patients in the Berlin pauper asylum were there from drink. At the Bicêtre, M. Contease found one thousand cases of alcoholic insanity out of five thousand two hundred and thirty-eight cases. Dr. Voison, of France, says, that during the last eighteen years, cases of insanity from drink have more than doubled. The increase of insanity among our own population is due largely to a change from a vigorous, well-balanced organization to an undue predominance of the nervous temperament, which is gradually taking place in successive generations. The educational pressure on the young to the neglect of physical exercise. The increasing artificial and unnatural habits of living, the great excitement and competition in business, are all tending to induce and multiply nervous diseases, many of which must terminate in insanity. These causes and the evils resulting from them, are propagated by the laws of inheritance in an aggravated and intensified form. It is an interesting fact which I have observed from an extended examination of the reports which have been sent to me from the various insane asylums throughout our country, many of which I have examined from the commencement of such institutions up to the present time,—that insanity is appearing at an earlier age than formerly. These reports show that in former years the average time at which the greatest number became insane, ranged between the age of thirty and forty, but an analysis of statistics shows that this average age is now coming on at an earlier period of life, generally appearing between the ages of twenty and thirty. This is supposed by the highest authorities to

be owing to hereditary influences, which have gradually become intensified by violation of physical laws in early life, want of proper training or too high pressure in education. From these preliminary remarks, we proceed to the investigation of the predisposing and exciting causes of insanity.

The first and great predisposing cause is hereditary predisposition. This has been noticed from the earliest history of the study of insanity. Esquirol observed and traced hereditary predisposition in about one-fourth of all his cases of insanity. Guislain estimated hereditary predisposition at 30 per cent. of all cases of insanity. Michét gave the opinion that at least one-half, if not three-fourths, of all the insane have either had at some time past, or have at the present time, some cases of insanity in their families. At the York Asylum during twenty-seven years, from 1846 to 1872, hereditary predisposition was traced in 31 per cent. of all the admissions.* With regard to hereditary predisposition, it has been determined that, as a general rule, if the mother is insane, the disease is more frequently transmitted to the offspring than if the father be affected; and also, the mother's influence in transmitting insanity to girls is much more to be dreaded than if the offspring be a boy; likewise as regards the father, insanity being much more certain to appear in male offspring, the father being affected, than in the female. There are, of course, many exceptions to this rule; but the laborious researches of Mr. Baillarger have been accepted by the best authorities as highly probable, if not conclusive.† It has also been proved that the lower forms of insanity, as imbecility, and also depression of mind, are in a marked degree hereditary. It has been remarked that the outbreaks of insanity in persons who inherit a predisposition to it, generally make their appearance, and seem to be in some manner connected with the growth and process of evolution of the individual at the period of puberty, childbirth, climacteric period, etc. Most people ignore the law of progressive development, and find it difficult to believe that an attack of insanity coming on in maturity, may have originated in the parent or grandparent, in whom it gave very little, if any, appreciable trace of its existence. Yet this is a fact, and is often the result of a lowered vitality or abnormal organic development of the

* Guy's "Hospital Reports" for 1877 show that, at Bethlem Hospital, Dr. Savage has traced hereditary predisposition in 34.9 per cent. of 1072 admissions. Out of 901 admissions to the Crichton Royal Institution, Dr. Stewart found 447 cases, or 49.61 per cent., whose parents or collateral relatives were affected.

† These conclusions were deduced from 600 cases of hereditary insanity.

nervous system, that has descended from generation to generation, gaining in intensity until it manifests itself by an outburst of insanity in children. One very important organic law which should be universally understood, is, that morbid impulses and characteristics and insane traits may disappear in the second generation, and break out with renewed intensity in the third. It is doubtless true, however, that a tendency or predisposition to mental disease may be transmitted to the offspring, and, under good hygienic and other favorable conditions, die out, and fail to be transmitted any further. Insanity also may appear in the same form in succeeding generations, or it may assume an entirely different form or even assume another form of nervous disease. Thus, it is common to see cases in which, the patient suffering from mania, the offspring may develop symptoms of epilepsy or chorea. Some authors have held that nothing was transmissible to the offspring but an aptitude or predisposition to some disease of the nervous system, and that the development of any particular type or form of nervous disease was largely the result of circumstances subsequent to birth. The diseases most frequently presenting themselves as the result of hereditary predisposition, have been found to be, aside from the typical forms of insanity, hypochondriasis, apoplexy, paralysis, epilepsy, convulsions, chorea, hysteria, and neuralgia. Undoubtedly, next to hereditary predisposition, may be marked in the present day as a predisposing cause of insanity, the great mental activity and strain upon the nervous system that appertain to the present age and state of civilization. The same feverish haste and unrest which characterize us as a nation to-day, and the want of proper recreation and sleep, tend to a rapid decay of the nervous system, and, sooner or later, the most overworked and overstrained minds stagger beneath the excessive burden ; and, one by one brilliant intellects and sterling men are lost to the world, who, if they had exercised moderation in their respective pursuits, might have been spared for years to enjoy the fruits of their industry. Among other predisposing causes may be mentioned those included by the International Congress of 1867, namely, great difference of age between parents; influence of sex; of surroundings; convulsions or emotions of the mother during gestation ; epilepsy ; other nervous diseases; pregnancy ; lactation ; menstrual period ; critical age ; puberty ; intemperance ; venereal excess, and onanism. Among the exciting causes of insanity may be mentioned, trouble and excessive grief; intemperance ; excessive excitement of whatever kind; epilepsy;

disordered functions of menstruation; pregnancy; parturition; lactation; fevers; injuries to the head or spine, and overwork.*

Intemperance.—It is impossible to estimate the complex influences that intemperance exerts in the production of insanity. All observers agree that it is intimately connected with, and is one of the main exciting causes of insanity. Lord Shaftesbury, in his evidence before the select committee on lunatics in 1859, expressed his opinion that fifty per cent. of the cases admitted into English asylums are due to drink. Many superintendents of foreign asylums have estimated the admissions from intemperance at twenty-five per cent. or higher, including not only the proximate, but remote cause of the disease. This percentage will be largely increased if we take into account the great number of cases in which the intemperance of parents causes the insanity or idiocy of their offspring. I have traced intemperance as a cause in a great many cases of general paralysis that have come under my care, and other superintendents of insane asylums have observed the same thing.

M. Lunier estimates that fifty per cent. of all the idiots and imbeciles to be found in the large cities of Europe have had parents who were notorious drunkards. Of 350 insane patients admitted during two years at Charenton, in Europe, insanity was attributed to drink in 102 instances. We have three forms of insanity resulting from the abuse of alcohol either in the individual himself or his progenitors, and these should, I think, be all included under the general term of alcoholic insanity. As this term is at present, however, synonymous with chronic alcoholism, we must find some more fitting term, I suppose, to include these three manifestations. They are as follows: First, delirium tremens or *mania a potu*, which is the acute and temporary form of mental derangement caused by intemperance. Secondly, dipsomania, which is characterized by an irresistible impulse to in-

* Hereditary predisposition in respect to marriage; persons with an insane diathesis should never marry; hysteria is not generally benefited by marriage; epileptics should not marry. We are not in a position to-day to say what cases of insanity will or will not recur after marriage. The danger to neurotic subjects is that of insanity, hysteria, or epilepsy as a result of the marriage. Marriage may or may not be beneficial in hysteria. Among the great evils of the day, which should be stamped out mercilessly, are fruitful marriages among those belonging to insane families. An insane diathesis may or may not be hereditary. This diathesis is marked by an excitable, nervous, melancholic temperament. Respecting consanguineous marriages, experience shows the injurious influence of such unions, for if there is a taint of insanity it will be intensified. It is not the fact of relationship, but the chance, of both having "similar vitiations of constitution."

dulge in alcoholic stimulants—an impulse which the intellect seems powerless to control, being overborne by the superior force derived from disease. It becomes, therefore, properly speaking, a form of moral insanity. Excluding the symptoms of delirium tremens, which are too familiar to bear repetition, we have in the other two forms of insanity from intemperance, hallucinations of sight and hearing, confusion of thought, perversion of feelings, suicidal tendencies, tremor of the facial muscles and tongue, at times anæsthesia of the extremities, with paralytic symptoms, ending in general paralysis. It is a fact of importance that the children of habitually intemperate parents often inherit a predisposition to mental diseases, which generally appear in the form of weakened mental faculties, as in dementia, or that they are entirely wanting, as in idiocy.*

Domestic *troubles and griefs* are a frequent cause; and it is roughly estimated that from twelve to fifteen per cent. of admissions are from this cause. Under the head of exciting causes are also included physical causes, as artificial deformities of the cranium, organic disease of the brain, etc. There are few of our asylums where, in the annual report, there does not appear a table setting forth the causes of the mental attack. For myself, I do not regard these facts of the highest value when accumulated year after year, or that they furnish very important data. They do not demonstrate, to me at least, the ætiology of insanity. In the first place, these reports are compiled on no common plan, and therefore the statistics cannot be reliable. For each case of insanity, in an asylum case-book, a single cause or two causes are allotted. It is decidedly the exception, I think, to find a single cause producing insanity in any given case, and we entirely lose sight of the collateral causative influences of the attack of the cerebral disease, which to me is very important, and is, I think, to any thoughtful physician. Instead of finding out *one* cause which I can say is *the* cause of a given patient's insanity, I prefer primarily to know whether hereditary tendency has contributed to the production of the mental disorder, and then to be acquainted with *all* the influences which have been concerned in the production of the mental disease. I think that, in most cases of mental disorder, we are apt to find *several* factors which

* Dr. Crichton Browne, in vols. i. and ii. of the "West Riding Lunatic Asylum Reports," says that the fact of the greater size of the head in civilized races, *unaccompanied by a proportionate increase in the pelvic diameters*, is an influence operating, to a great extent, in the production of idiocy, imbecility, and insanity. Dr. Down says that the greater difficulty of parturition and the exalted emotional life of the mother is the main cause of the danger to mental power in the eldest child. We think him right.

we cannot separate properly, and that *all* have played a part in inducing cerebral disease. Statistics, therefore, of the causes of insanity, are too apt to be inadequate and unsatisfactory to the student of psychological medicine, and he will gain more by studying the detailed records of individual cases, and extracting his facts from such study. When we see how readily and inevitably the future mental state and characteristics of the next generation are determined by the health and the proper mode of living of the present one, it behooves all physicians, who, perhaps more than any class of men, are placed in the closest and most confidential relations to their fellow-men, to endeavor to promote such modes of living and thinking, that the descendants of the present generation may be the gainers and not the losers by their advice. The very mental states and emotions of a pregnant woman are indelibly impressed upon the offspring, and how important it is that the condition of such a woman should be that expressed by the old motto *mens sana in corpore sano!*

Herbert Spencer, in speaking of the emotions, remarks, "We know that emotional characteristics, in common with all others, are hereditary, and the differences between civilized nations, descended from the common stock, show us the cumulative results of small modifications hereditarily transmitted. And, when we see that between savage and civilized races, which diverged from each other in the remote past, and have for a hundred generations followed modes of life becoming even more unlike, there exist still greater emotional contrasts, may we not infer that the more or less distinct emotions which characterize civilized races are the organized results of certain daily repeated combinations of mental states which social life involves? Must we not say that habits not only modify emotions in the individual, and not only beget tendencies to like habits and accompanying emotions in descendants, but that, when the condition of the race makes the habits persistent, this progressive modification may go on to the extent of producing emotions so far distinct as to become new; and if so, we may suspect that such new emotions, and by implication all emotions, analytically considered, consist of aggregated and consolidated groups of these simpler feelings, which habitually occur together in experience; that they result from combined experiences and are constituted of them." Respecting the cause of insanity among Americans to-day, I do not hesitate to say, that inheriting a delicate nervous organization, far in excess of physique, as a rule, gives rise in modern society to a great increase of the neuro-

pathic constitution. I have found overstrain of the brain and excessive use of stimulants to be two of the principal causes of insanity, and also of diseases of the nervous system generally. For a moral cause to produce insanity seems to me to necessitate an organic predisposition to it, although no doubt sometimes a nutritive disturbance of the brain may be produced by shock to the nervous system, which may result in mental disorder in a previously healthy person. This, I think, however, is a rare occurrence.*

The Importance of the Early Recognition and the Repression of Mental Disease in its Incipient Stages.

There exists in insanity, in common with other cerebral diseases, a stage of incubation, in which the insanity is not yet characterized, and in which it commences with incomplete manifestations. It is an equivocal state, differing but little from perfect sanity, but it is the earliest phase of mental alienation, and if recognized by the general practitioner, and promptly treated in this incipient stage, subsequent trouble might be averted. As a primary proposition for the consideration of the general practitioner, who must, for the prevention of insanity, understand the principles which are the foundation of psychological medicine, we would say, that in his relations with the young in the educational period, he should remember that precocity is a sign of biological inferiority, and that the precocity of organisms and organs, is in an inverse ratio to the extent of their evolution. The psycho-neuroses which attack an intact brain, often commence in intellectual exertion of the exhausted brain, the exhaustion being

* Respecting the relations of the seasons to mental disturbance, Parchappe, Guislain, Aubanel, and Thore all agree that there is a greater frequency of attacks of insanity during the summer months, while periodical insanity appears in the spring. As to the influence of civilization as a cause of insanity, Drs. Bucknill and Tuke say that insanity attains its maximum development among civilized nations, remaining at a minimum among barbarous nations, the unfavorable causes being principally, the increased susceptibility of the emotions to slight impressions; the abuse of stimulants; the overwork of the brain, especially in early life, by an overwrought system of education; and that condition of the lower classes which is a constant attendant upon civilization—the higher emotions or moral sentiments, the lower propensities and the intellectual faculties, being thus all subjected, separately or combined, to an amount of excitement unknown to savage tribes. From all the preceding it does not necessarily follow that civilization carried to its perfect development, a civilization that would exactly temper the force of the emotions, moderate intellectual exertion, and banish intemperance, would generate mental disease. We must educate the lower classes and moderate the intellectual strain on the higher classes, to antagonize insanity and prevent it.

induced by taking up too great a variety of subjects for study during the educational period of life. We have, as a result, a passive dilatation of the bloodvessels of the brain, connected with disturbances of nutrition, and anæmia of the brain which may produce grave nutritional disturbances in the ganglion cells of the cortex of the brain. We get, as a result of either of these states, habitual headache and a loss of intellectual tone. Perhaps these slight disturbances may not attract particular attention, or such cases may be dismissed with some simple prescription, but we must remember that one of the gravest and most incurable of nervous disorders, progressive paralysis, commences in just this insidious manner, as a vaso-motor disturbance of nutrition of the cortical portion of the brain, where the vessels of the pia mater soon get into a state of passive dilatation, and the disease thus established proceeds to its termination. Great attention should, therefore, be paid to the very earliest indications of brain exhaustion, whether in school children, or the young during the whole educational period of life, or in those of more advanced age where the earliest symptoms are those of nervous exhaustion, which, if not checked, rapidly lapses into actual mental disorder. The brain may not be intact, but may be predisposed to the acquisition of mental disease by hereditary or acquired vices of conformation or nutrition, and then constitutional affective insanity, moral insanity, the monomanias, epileptic insanity, hysterical insanity, hypochondriacal insanity, or periodical insanity may result, if nervous exhaustion should appear and run an unchecked course, or if the early symptoms of these states be disregarded as matters of slight importance. If a patient complains of general malaise, impaired nutrition and assimilation; if we find muscular atonicity changing the facial expression; if neuralgia is present; if we find cerebral anæmia; if we find our patient manifests mental depression, and above all if he is sleepless, we have, indeed, a rapid state of nervous prostration which may soon precipitate the patient into active insanity, if these symptoms are not most effectively combated. Irritability and distrust are grave psychical symptoms in asthenic cases. If we have cerebral hyperæmia in our patient, headache may then be a prominent symptom. We must recognize these symptoms as those of a grave nervous prostration, which unchecked lapses into actual insanity with great readiness. I never like to see neuralgia developing in such cases, as it is, when not malarial, very often a premonitory symptom of impending mental disturbance, when associated

with other symptoms of nervous prostration. Profuse perspirations also are found in connection with nervous prostration, and occur at any hour of the day or night. A loss of the normal elasticity of the skin is another prominent symptom of disorded nervous action. Arsenic as a remedy in this latter class of cases is very valuable. In children, or young people from fifteen to twenty years old, very grave psychical disorders may appear, which require the promptest treatment. The history of such patients will usually be, that during childhood they have been excessively nervous, and have, perhaps, had convulsions in infancy. They have been very emotional children, suffering from night terrors. There are periods of marked mental inactivity, alternating with a hyper-activity of the mental functions, and such patients do not take or manifest a normal healthy interest in their surroundings. If hysterical girls, they may neither eat nor sleep for some days at a time. There are no suicidal or homicidal tendencies in these cases, but a disposition to recurrent mania. In the menstrual psychoses of young girls and women, the psychic disorders which come on at these times in many of them, are, I think, more than a natural exaggeration of the nervous excitability which we may naturally expect in a female at this period. It is a true periodic insanity in many cases, an acute psychosis, with the intellectual centres involved. They are vaso-motor neuroses with recurrent cerebral hyperæmia. We find this form of periodical insanity at any epoch of sexual life, and there is marked physical and mental prostration in the intervals between the paroxysms, and we should combat these states by every means in our power. I remove uterine trouble, if any exist; use the constant current of electricity to the central nervous system to improve its nutrition, and give sodium bromide (grains, 60) and fluid extract ergot (℥½), in combination, thrice daily. The monobromide of camphor, in Clin's capsules of 4 grains each, is also very valuable in some of these cases, given twice daily, the last dose just before retiring. I also, for one week preceding the appearance of the menses in such women, employ cerebral electrization daily, using the constant current, which possesses the power of combating and perfectly antagonizing the various congestive states, which, unchecked, lead to insanity. Of all the cases in which I am accustomed to use electrization of the brain, none give more gratifying results than these periodic menstrual psychoses in women. A marked tendency to sleep, even in cases which have been sleepless for days, follows these applications. I

have never seen any evil results from the use of moderately strong currents judiciously applied; on the contrary, I have more than once prevented the access of insanity by this means.* Certainly, I know that in many cases where there had been a recurrent menstrual psychosis, or mania, this treatment has resulted in my hands in the complete cure of the patient, when conjoined with the proper medicinal treatment, so that I most earnestly, and from experience, advocate its use. I shall, in a subsequent chapter in this volume, give my views at length on the subject of the value of the constant or galvanic current of electricity as an application to antagonize the various congestive states of the brain.

I would insist upon the point, that in young ladies, especially, the mental future depends very largely upon the nervous and physical strength which they attain before the age of twenty-one. Many patients are brought to me suffering from nervous prostration and protracted headaches, during the monthly menstrual epoch, all on account of too great intellectual exertion, inducing a very nervous and hysterical condition. These are the young ladies who stand high in their classes at schools and seminaries. We too often sacrifice the constitution to what we deem *educational necessities*. I deem the necessity in a young girl, to have plenty of bone, blood, and muscle, and to be well developed, with an accurate balance between the physique and the nervous system, and if something has to be sacrificed, let it be some of her education, and *not* some of her mental or physical health. Insanity will just as surely follow neglect of mental hygiene, as the zymotic diseases follow neglect of sanitary precautions; and we too often forget this fact, for the reason that the incubating stage of insanity may be, and often is, long and insidious, and easily overlooked by one who is not a student of psychological medicine. It is very easy to ruin the delicate tissue of the brain by overstraining it when exhausted.

* The writer has at present under his care a case illustrating the power of the galvanization of the brain in a young married lady, who from neurasthenia passed into a state of mental disturbance, and thought it her duty—so she said—to murder her husband and children, to whom she is devotedly attached. She had not menstruated for several months, and her physician told her that she was suffering from "change of life." Her age was thirty-six. A course of hot baths with cold to the head, centric galvanization and electrization of the brain daily, with the citrate of iron and quinine and the liq. acid. phosph. comp. removed the amenorrhœa, so that at the end of three weeks my patient was menstruating. The cerebral hyperæmia was thus relieved, the idea of homicide vanished like dew before the sun, and my patient is to-day, five weeks after the first day of treatment, a perfectly sane woman. She was also treated in her own home, which I regard as the severest test of treatment, as such patients need a change of scene and surroundings.

There are too many young brains, not strong and vigorous, but unstable and subject to irregular and uncertain action, which have been rendered so by an entirely false system of education. There is a great deal of brain fatigue among professional and business men, resulting from a preponderance of waste over repair, which induces grave nervous prostration. Such patients complain of a loss of physical and mental power, and of an inability to do what they could when well; and these same patients exhibit exaggerated sensibility, being very easily affected by trivial impressions. Such patients suffer much from vertigo and confusion of mind, owing to an impaired nutrition of the brain and spinal cord and a diminution of vascular tonus. One very important set of symptoms to early recognize and combat, is that characteristic of cerebral syphilis. In these cases we have a deepseated headache, of extraordinary intensity, with nocturnal exacerbations and of long duration. The headache is the premonitory symptom of very grave cerebral mischief, which we may ward off if we recognize its significance. As the results of the cerebral congestion of specific origin, we have vertigo and mental dulness, temporary disorders of the special senses, and momentary impairment of the intellect. These symptoms, at first transitory, may become permanent by inattention. Congestive attacks of greater intensity, even attaining the grade of apoplectic fits, may now occur, and attacks of intermittent paralysis. In the gravest forms of specific cerebral disease, an apoplectiform *seizure*, followed by fatal coma, may usher in the attack with no premonitory symptoms. Epilepsy, *if commencing after twenty years of age*, is due, probably, to specific brain disease, and is often preceded by the premonitory headache of which I have spoken. In these cases I always put a patient immediately on energetic antisyphilitic treatment, as I care little about the history. The epilepsy is to me evidence of the existence of the disease. The mental symptoms, when insanity appears, are those of exaltation, delirium, and mania. The gravest forms of this disorder often yield rapidly to appropriate treatment. If we find in a patient, a male more particularly, persistent mental dulness, and muscular feebleness, existing as vague undefined symptoms, it is always well to examine his history pretty thoroughly, and a specific course of treatment may very likely prevent, in such a patient, the invasion of insanity. We must not promise perfect recoveries in these cases of cerebral syphilis, for some never recover, and there may be incomplete recoveries. In a certain proportion of cases,

however, we make a rapid and brilliant cure. Cold douches are very valuable in cerebral syphilis as an adjuvant to specific treatment, and should never be omitted. I am more inclined to think that syphilitic brain disease is overlooked, than that it is so very rare as some authors claim. I have detailed the symptoms of the gradual breaking down of the nervous system, causing nervous prostration and incipient insanity, and would now briefly state my treatment of such states. The treatment of insanity in general will occupy a separate chapter in the course of this volume.

We must secure for our patient good refreshing sleep, and take him away for a time from business cares and anxieties, and, if a woman, give her rest. If the condition is asthenic, alcoholic stimulants are indicated, to ward off the cerebral anæmia, which, if not relieved, will bring on an attack of mania. Strychnia is also indicated in these anæmic states. I usually use the citrate of iron, quinine and strychnia, rest, massage and electricity, together with a milk punch three times a day. If there is cerebral congestion, I employ, as I have said, the constant current of electricity to the brain, to antagonize the congestive states. The bromide of zinc, commencing with ¼ to 1 grain doses, and the hydrobromate of quinine, are both useful in cerebral congestion, also Fothergill's solution of hydrobromic acid in 15 to 30 minim doses. We are more apt to have an anæmic and asthenic condition of the system, especially in women. In these conditions quinine is one of the best nerve tonics, and may be given in 1 or 2 grain doses before each meal. Arsenic in Fowler's solution, 5 minims after each meal, continued for some weeks or months, is also very valuable indeed. By appropriate and judicious treatment we may get a perfect cure in the incipient stages of insanity, and generally with no fear of a relapse, unless it is strongly hereditary.

CHAPTER III.

PREVENTION OF INSANITY.

Insanity is often a preventable malady. Primarily we must not exhaust the brains of children by a cramming process in education, which cannot fail to injure the nutrition of the brain and impair it. An immense harm is done in this way by producing premature mental decay and nervous exhaustion, appearing about the age of puberty.

The body must be developed in all its parts and organs if we want healthy minds. At present we are developing a race of children whose nervous system is far in excess of their physique, who are predisposed to the acquisition of nearly all the various forms of nervous disease upon slight exciting causes, and many of these types of nervous disease readily lapse into insanity. See to it, you who are family physicians, that the children who grow up under your care are developed physically, even if it be at the expense of the neglect of early education. It is not the precocious child who makes the strong man mentally. Discourage all precocity, and keep such children from study until they have a sound healthy body for a foundation, and then avoid overstimulating the mind by too many studies at once.* A young girl recently came under my care for complete nervous exhaustion, who was trying to master *thirteen* different branches at once, in her most trying period of bodily development. A system of education which allows such nonsense cannot be too severely condemned by physicians. It is absurd for young girls to be put through a cramming process of education, which, at the critical period of life, cannot fail to weaken their nervous system; and, when this is combined with a society life, the result is a superficial education, a broken-down nervous system, and an inability as women to go through the trying duties of maternity. It is for the family physician to say which children shall study hard, and which shall not. Teachers of the young are not qualified to give any such advice. The prevention of such disease should be the highest aim of the physician. Too often an indifference is displayed by him respecting his duties, as a family adviser, in such matters. Insanity is also to be prevented by such an education of the masses, as will make them understand sanitary and hygienic laws, and live in accord-

* The general practitioner, for whom this book is especially intended, is in a position to check the sources of insanity at their very beginnings. By carefully directing the mental and physical life of the pregnant woman he may form the future mental complexion of the unborn child. He may watch over the child's brain during the early formative period of infancy and childhood, and so advise the parents that they may guide their children in the paths which lead to mental stability. He may recognize the insane diathesis, and by intelligently recognizing that a person is more liable than others to mental disease may apply "a wise culture to the erring emotions, and discipline to the conduct in the early years of life while they are yet applicable, and the fearful heritage may oftentimes be avoided." Moral treatment here is the prevention of insanity. It has been well said that "the celibacy of the insane is the prophylaxis of insanity in the race." Treatment at the outbreak, away from home and under nurses who have patience, endurance, temper and health, would often prevent lifelong insanity.

ance with them, so that they may develop the highest moral, physical, and intellectual health.

Respecting men, I think that modern nervousness is largely due to mental anxiety about business, the abuse of tobacco, and sexual excess. These three things in combination, especially if the use of stimulants be indulged in, will break down and shatter the strongest constitution, and induce ataxy, paresis, and insanity in those who inherit weak nervous systems from their progenitors. Regular hours, amusements to divert the mind from the cares of business, freedom from alcoholic stimulants, nourishing food at regular hours, properly digested, abstinence from tobacco during the years previous to puberty and until twenty years of age, and daily attention to the bowels, with free bathing, will keep most men sound and healthy. The subject of education in its relations to mental disease is a very interesting one. It is very important, as the elaboration of cerebral structure is taking place in childhood and youth, that suitable exercise and stimulation should be carefully applied, so that the brain may be brought to its highest possible development. While we must remember that brain-centres that are not properly stimulated and exercised do not develop, and must consequently insist on proper physical and mental education, and moral and religious training, we must, on the other hand, as carefully avoid undue educational pressure and brain-fatigue and exhaustion by overstimulation, especially in badly nourished or sickly children, or in those who are precocious and excitable, as too many American children are.

It must be carefully borne in mind that injudicious stimulation of the brain in the teaching of children, may not only induce nervousness but even structural disease itself. While I believe most firmly in the advantages accruing from stimulation of the nervous centres by education wisely applied, in those who are strong and vigorous, and consider that ignorance produces a poor development of imperfectly acting brain-tissue which tends to degenerate, I deprecate the present cramming process so common, which too often menaces the mental integrity of naturally delicate children, who, in a great many cases, have inherited a disproportionate development of the nervous system at the expense of their physique.

CHAPTER IV.

DIAGNOSIS OF INSANITY.

THERE is probably no disease which presents greater difficulties in the way of diagnosis, than insanity. In most diseases we examine physical signs and symptoms, and we determine by our senses the existence of such diseases. In insanity, on the contrary, we have to be guided chiefly by our knowledge of the normal functions of the mind, and in our examination we have to rely on our intellect rather than on our senses, although of course the latter are called in to assist us. It is, however, very often extremely difficult to decide with certainty, as we are expected to do, as to the existence of mental disease, and we assume a great responsibility, whichever way our decision may be given. We either give the patient liberty to take his place in society, and thus expose society to the consequences if he prove to be insane, or we place him in confinement in some institution for the treatment of the insane, thus depriving him of his liberty and his family of his support.

It becomes then a matter of great importance to decide rightly as to the existence of mental disease, for if this is not rightly done, we shall expose ourselves to the risk of great mortification, and also to the loss of professional reputation. Before going to see a patient who is to be examined for the existence of insanity, it is advisable to find out all one can from the friends and relatives; but in accepting such statements it is wise to allow a wide margin for their information in regard to hereditary predisposition, as most people, foolishly considering the existence of insanity in their family a disgrace, will pertinaciously conceal and deny this fact. Another reason for this concealment may be, that the members of such families are not infrequently odd and eccentric in their behavior even when perfectly sane, and do not care to have their peculiarities attributed to hereditary taint of insanity, and therefore endeavor to mislead their physician on a point which is to him of the utmost diagnostic importance. Indeed, this and the question of previous attacks, are perhaps the two most important points in the diagnosis of any given case. We should endeavor when we are called to our patient, to gain his confidence, and from a general conversation lead him cautiously to his state of health and mental feeling. If we are abrupt and wanting in tact we shall

probably defeat our object, and the patient, if displeased, will either refuse to listen to or answer our questions, or will become very angry at our conspiring to deprive him of his liberty. If we are fortunate enough to get a history of the patient, we can generally determine easily, the existence or non-existence of insanity, by the patient's appearance and conversation. Many times, however, we have to rely alone on the conversation, general appearance, and conduct of the patient, unaided by any other resources. After having gained our patient's confidence and having drawn him into a pleasant conversation, we should first inquire about previous attacks, then into his hereditary history, then into any predisposing causes, such as intemperance, vocation, habits, etc., which may have operated in the production of insanity. Also as to injuries to the head or spine which may have occurred, sunstroke, etc. We should then systematically, but carefully and cautiously, examine into the vegetative and reproductive functions, and then carefully examine the nervous system for the existence of such lesions as paralysis, epilepsy, catalepsy, hysteria, and allied affections. We should next examine the different senses, beginning with sight, and in this way we shall find out if our patient has good vision, if the retina is normal, and, what is more important, we may discover if he has hallucinations or illusions pertaining to this sense. We may then proceed to the sense of hearing, examining for deafness, and also to discover any hallucinations or illusions of hearing. Proceeding to the sense of smell, we shall discover if it is normal, and also if there are any hallucinations or illusions connected with it. Taking up the sense of taste, we may inquire as to the existence of hallucinations or illusions. Patients often complain of their food being poisoned, or that they are eating injurious and hurtful things with their food. The last of the senses, that of touch and nervous sensibility, may be examined for imaginary sense of pain, the existence of reflex action, hyperæsthesia, and lastly, for hallucinations and illusions pertaining to this sense or referring to internal organs of the body. The mental symptoms unconnected with the special senses and pertaining to the intellect, the emotions, or the will, may finish the examination. Whether the diagnosis of insanity present itself to the physician in a purely medical or in a medico-legal point of view, the principles of diagnosis are the same, and we must pursue our examination in precisely the same manner. The first thing we are generally called upon to decide is, whether the patient can be treated at home, or whether it is necessary to place

him in an asylum, and we are also probably asked for a prognosis, which latter cannot be too guarded, whatever may be our own impression at the time, about the patient. Let us consider for a moment the first question, that of the propriety of removing our patient from his own home, either to some private retreat or to a public asylum. For those who can afford the expense I prefer a residence away from home in some private retreat where but few patients are admitted, for the reason that they unquestionably can have much greater care and attention bestowed upon them than in the congregate plan of treatment. If they cannot afford this, a residence in any well-regulated public asylum, where, as a rule, the superintendents are earnest, thoughtful men, careful for their patients' welfare, is to be desired *as soon as possible*, while the disease is in its early curable stages.* Insane patients are, by the very nature of the disease, inclined to do mischief. They are controlled in their actions by delusions which are to them vivid realities, and no one knows what they may consider it right and proper to do when under the influence of such delusions. Some of the most fearful crimes have been committed by those who have previously been regarded as harmless patients, and no one, therefore, should take upon himself the responsibility of advising that a patient whom he is called to see should be kept at home. The mere moral effect of a residence in a well-regulated asylum for a time, at the onset of insanity, has an immense effect on the mind of a patient, and may prevent consequences that might prove most disastrous were he to be at home and exposed to the many causes of excitement from which he is sheltered in an asylum. We must also decide what form of insanity the patient is laboring under, and in a medico-legal case must give our diagnosis as to the insanity of the patient in its relation to his civil capacity and responsibility for criminal actions, and also as to feigned and concealed insanity. In the latter class of cases, medico-legal cases, it is of the utmost importance for every physician to understand that a man is not irresponsible for crimes which he commits, from the fact that some of his ancestors have been insane. The question to be determined here is, whether the hereditary taint, by being transmitted to the individual in question, has influenced or

* It should be borne in mind that much of the popular prejudice against hospitals for the insane springs from unfounded statements made by persons who have been inmates of such institutions, and who have been discharged before they were fully restored to reason. A person who has made a complete recovery generally entertains, not hostility, but the liveliest feelings of gratitude, towards those who have been instrumental in the restoration of reason.

determined at all his volitions, impulses, or acts. If, on the one hand, he has been noticed for displaying such peculiarities as usually proceed from hereditary taint, and if the crime was apparently unaccompanied by any adequate incentive, doubts of his legal guilt are then to be carefully considered. On the other hand, if the criminal act appears to have been rationally performed, and with some adequate and usual incentive, and if the individual has previously been free from mental infirmities or peculiarities that might be attributed to hereditary transmission, then we cannot justly advance insanity as a plea for defence from the consequences of crime. Mental unsoundness, if unconnected with the testamentary disposition, should not destroy testamentary capacity. If the will is not affected by, or is not the product of insane delusion; if the testator has not ignored the claims of near relationship or of natural affection; and if his mental faculties are so far normal that he understands the nature of the act and the consequences arising from it; and if he has a clear idea as to the amount of property he is disposing of; and if in making the will he has not manifested any insane suspicion or aversion, the will should be regarded as valid.

The diagnosis of insanity is at times very easily made. Thus, if we find our patient, from having been previously moral, affectionate, and industrious, has become immoral and dissolute, exhibits alienation of affections and neglects his business, all without adequate cause, it is of course easy to determine his insanity, although of course changes may take place in the character of individuals without any suspicion of insanity being excited. A great many cases, however, are on the border line which separates sanity from insanity, and it often requires the nicest discrimination to determine whether such a patient shall be placed under treatment or not.

It now remains to consider the diagnosis of the different forms of insanity which we meet with. In mania the physiognomy is generally distinctive. The countenance is furrowed, the eye wild and vacant, and there is generally a peculiar want of agreement in the expression of the features. The hair often becomes harsh and bristling, and the ears may become shrivelled. The actions, demeanor, and dress of an insane patient are generally indicative of mental peculiarities, and oftentimes the latter may be indicative of the nature of the patient's delusions, or, if not, it may display marked eccentricity.

In *acute mania*, it is generally easy to discern in the countenance

the presence of some strong emotional characteristics, such as pride, hatred, or anger. It has been remarked that insanity anticipates the effects of years and prematurely imprints upon the countenance the facial lines characteristic of habitual emotions, while in lunatics of advanced age, these are observable in a greater degree, and are more deeply marked than they ever are in sane persons. In this form of insanity—acute mania—the bowels are generally constipated, the urine is loaded with phosphates, and the patient suffers from protracted loss of sleep, which is diagnostic of acute mania, and which is a symptom that cannot be feigned by an impostor. Patients of this class pass several days without sleep, and sometimes weeks with but a few hours of sleep in the course of the whole time. Hallucinations of sight and hearing are far more frequent in this than in any other form of insanity. There may be also rapidly changing delusions, and there is generally an intense muscular restlessness, which manifests itself either in destructive impulses, or in continual motion, which rapidly induces dangerous exhaustion, if not properly treated.

In *melancholia*, the most noticeable symptoms will be despondency, fear, and despair, and the expression of the mental states are depicted in an unnatural degree of intensity upon the countenance of the patient. The patient generally wishes to be alone, is gloomy and depressed, has delusions of fear and persecution, imagines he has committed unpardonable sins, and in the acute cases of melancholia no more pitiable spectacle can be imagined, and the expression of terrible apprehension and fear which occupies the countenance is not easily forgotten. The skin is generally dry, harsh, and muddy, and the bowels constipated. It is such cases as these which have to be carefully watched lest they give way to the suicidal tendencies which are generally present.

In *dementia*, the lines of expression are more or less obliterated, and the vacant, meaningless expression and smile or laugh are indicative of this form of insanity. When the mind is tested, the power of memory, attention, and comparison will be found to be partially or entirely wanting. It is only in primary dementia that the practitioner will find difficulty in reaching a decision, and sometimes these cases are very difficult to determine. In such cases one of the most valuable symptoms is loss of memory. The patient may, in his conduct and conversation, exhibit no marked peculiarities, but when the powers of his mind are tested as to the recollection of past events, or even as to the conversation of a few minutes previous, it will be

found that he has entirely forgotten these things. This form of insanity is generally unaccompanied by hallucinations or delusions, and is nearly always due to some exciting cause, such as injuries to the head, attacks of apoplexy, or strong emotional disturbances. There is another variety of dementia which is secondary to acute attacks of insanity, and which differs somewhat from primary dementia. In this form of dementia we meet with the remains of the delusions of acute mania, and we also find an exaggerated state of emotional feeling which remains after the storms of acute mania have blown over, and the functions of the mind are beginning to suffer decay. The diagnosis of *general paralysis* is very easy after we have become acquainted with the disease. In the early stage the most marked symptom is a thickness of articulation, particularly noticeable when the words articulated by the patient are composed of several consonants, when these will be shuffled over in a very characteristic manner. The lips of the patient while he is speaking will be seen to tremble, and likewise the tongue, if it is protruded from the mouth. The gait of these patients is very characteristic and peculiar. They shuffle along in a manner that denotes at once the want of co-ordination in the muscles of the limbs. Later in this form of insanity the power over the sphincters is lost, the patient has to be cared for like an infant, and becomes a great trouble to his attendants.

There is another class of patients whose only manifestation of insanity consists in an abnormal condition of the *moral power*, and who exhibit no obvious intellectual aberration or impairment. The symptoms of the mental disease in these cases are limited to the exhibition of morbid impulses which the intellect seems powerless to control. These cases of *moral insanity* are sometimes difficult to distinguish, and the laity generally attribute such manifestations to total depravity. In such cases, we must compare the patient with himself when in a state of health and not with any imaginary standard of sanity or insanity. We should bear in mind in this class of cases the excellent definition of Dr. Combe, who says: "It is the prolonged departure, without any adequate external cause, from the state of feeling and modes of thinking usual to the individual when in health, that is the true feature of disorder of the mind."

We have thus far considered the diagnosis of insanity only in its relation to the existence of the disease. Let us finally look at the *diagnosis of recovery*, which oftentimes becomes a very delicate and

difficult task for the examiner.* We are to determine whether the patient has recovered so far as to leave no trace of insane ideas and delusions. We must compare the man with his former self in a measure, and see if his natural tastes, affections, impulses, and mental powers have been restored. Of course we must make an allowance for a certain amount of weakness in his intellectual functions, just as we expect to find a man weak bodily after an attack of typhoid fever or other severe disease. We must determine whether the man's intellectual faculties, his memory, reason, and judgment are in a state to enable him to take his place and position in active life. We must observe also whether his conduct is reasonable and quiet. In homicidal or suicidal cases we must assure ourselves of the disappearance of the propensity. There are many patients who, although not recovered, are in such possession of their intellectual faculties as to become very impatient of restraint and confinement, and no amount of reasoning can make them appreciate the necessity for further detention in an asylum. A marked case of this character was formerly under my care, and illustrated forcibly this class of patients, who, if exposed to the excitement of society before a thorough cure has been effected, would almost inevitably have a relapse. This patient would argue for an hour at a time very sensibly and forcibly upon the injustice and oppression of keeping him longer as a patient, and would challenge any proof of his insanity, and probably nine out of ten physicians not acquainted with him would have said that the man was sane. He would converse rationally upon all subjects until the subject of religion was introduced, when he would immediately reveal gross delusions, and would maintain with the utmost sincerity that he could perform miracles, and that he was frequently the subject of them. This shows the importance of examining a patient upon all conceivable topics before pronouncing him cured. These are the cases that generally make their friends and relatives, and particularly strangers, feel that they are unjustly detained, and are the ones who, if they obtain their release in any way, publish their wrongs, and create in this way ill-founded prej-

* Dr. Ray says a beginner in this department of our art hails every improvement as the commencement of convalescence, and is apt to regard the appearance of a few healthy traits as the unquestionable presage of recovery. It is not until a later period that he becomes acquainted with that peculiar oscillation which marks the movements of mental disease and fully comprehends the fact that serious disorder may exist in connection with many sound, healthy manifestations of character. A person may be unequivocally insane, retaining some flagrant delusion, and yet be calm and apparently rational. With this exception his views are correct and clear.

udices against institutions for the care of the insane. Generally speaking, if a person who has been insane expresses himself as having been unjustly treated and detained, and denies the fact of his insanity, we may be pretty sure that he has not fully recovered, as persons who are really convalescent are generally fully convinced that they have been insane, and are generally very grateful for the care and attention that have been bestowed on them, and express themselves so. Such patients are nearly always willing to be guided by their physician's opinion as to the proper time for their discharge, and do not, as a rule, exhibit that intense restlessness and desire to return home which is so apt to characterize doubtful recoveries. The first symptoms of recovery are the return of natural tastes, inclinations, and affections in the patient. Drs. Bucknill and Tuke, in speaking of symptoms of recovery, lay down the following excellent rules as evidences of restoration of the mind:

1. A natural and healthy state of the emotions.

2. The absence of insane ideas or delusions.

3. The possession of sufficient power of attention, memory, and judgment to enable the individual to take his part as a free member of society.

4. Tranquil and reasonable conduct; and say regarding them, "when these four symptoms of recovery coexist there can be no doubt that recovery has taken place."*

Prognosis.

The chances for cure are much greater in recent than in chronic cases. When treatment is delayed the patient's chances diminish greatly, and when treatment is delayed for twelve months, not more than twelve per cent. generally recover their mental health. On the other hand, statistics show that, when the disease is treated promptly, about fifty per cent. may be cured. The results of treatment in cases of insanity resulting from sexual vice are very unsatisfactory, the disease tending toward dementia rapidly. Doubtless a certain

* Dr. Ray believes that it is not safe to discharge a patient while he continues to believe in the reality of any single notion or occurrence that was entirely the offspring of fancy, because such a belief indicates morbid action, which, however circumscribed at present, is ever liable to spread, and induce farther mental disorder. Indeed, the evil is seldom so limited as it seems to a casual observer. A very marked remission, amounting, perhaps, to a complete disappearance of every trait of disease, occurs within the first month of an attack, and is often followed by a renewal of the disease. *This is the result in by far the greatest number of cases.*

percentage of cases relapse, and there is a greater tendency of hereditary insanity to relapse than in any other forms, hereditary predisposition being very unfavorable to permanent recovery, although you may get good results and cures at first. The influence of epilepsy is very unfavorable, and of course idiocy and imbecility present an unfavorable prognosis. General paralysis is, perhaps, the most unfavorable form of insanity and is very fatal, cases generally dying in about three years, although death may occur at a much earlier and also at a much later period of the disease. Dementia, with the exception of primary dementia, is also regarded as incurable. Delusional insanity and hallucinations and illusions of the senses are rather unfavorable than otherwise, as regards prognosis. Acute mania is a favorable form of insanity and is recovered from, and also acute melancholia. Climacteric insanity presents usually an unfavorable prognosis. Hysterical insanity is very curable. Puerperal insanity is also very curable if seen at once, and a full mercurial cathartic given to commence the treatment, as the cause of the disease is septicæmia, caused generally by absorption of retained products of the placenta. Post-febrile insanity is not very favorable as regards prognosis. Successive attacks diminish chances for ultimate recovery, although you may have repeated relapses and recoveries ensuing. The prognostic value of difference of the pupils in insanity is not great, according to most authorities, and does not seem to justify an unfavorable prognosis ; paralytic cases are excluded in these remarks. Cleanliness, restored affections, return to ordinary tastes or habits, are very favorable symptoms, and also the return of suspended secretions. Prolonged insomnia is an unfavorable symptom. Insanity occurring in the young some time before puberty, I believe to be very unfavorable, and to tend to imbecility. Respecting menstruation in women, the function may be restored without any corresponding improvement in mind, or the mind may be restored and the menses remain suppressed; Dr. Ray says, of the return of the menses, that "we may certainly regard it as a ground of hope in reserve."

Dr. Blandford, of England, in writing on the prognosis of insanity, says: 1. "The general prognosis of insanity will depend on the duration of the existing disorder. Perhaps the best established fact of all is, that the chances of recovery diminish in direct proportion to the duration of the malady, and that it is, consequently, of the utmost importance to place a patient early under adequate and appropriate treatment. If a twelvemonth elapses without appreciable im-

provement, the chances are decidedly unfavorable. If delusions or hallucinations remain fixed and unchanged at the end of a year, especially if there be hallucinations of hearing, the prognosis is bad. The chief exception is where there is marked melancholia. Patients will recover from this after long periods; whereas such recoveries are seldom found in insanity when depression is absent.

2. "When the cause of the insanity has been of long duration, the prognosis is less favorable than when it is a passing or accidental form.

3. "Is the prognosis unfavorable in hereditary insanity? So much of the so-called simple insanity is hereditary, that we must admit that recoveries from it are not infrequent, for it is from this simple insanity that recoveries chiefly take place. Hereditary insanity is brought about by very slight causes, and thus the prognosis is often favorable, and recovery takes place; but relapse is to be feared, and the prognosis in a second or third attack is not nearly so good. In this hereditary insanity, too, we frequently meet with the cases of recurring and 'circular' insanity, the progress of which is most unfavorable. Both Ray and Griesinger have remarked that the prognosis in hereditary insanity is favorable only where the individual has previously been of normal mind. When he has always been eccentric or semi-insane and undoubted insanity at last manifests itself, the prognosis is very bad.

4. "The more acute the symptoms, the greater the cerebral disturbance and insomnia, the more favorable is the prognosis, if the case is recent. Conversely, the prognosis is bad when there is little bodily disturbance, where sleep is present, the appetite normal, and the secretions unaffected, especially if persistent delusions or an entire moral change are found.

5. "As all deviation from the ordinary mental state and disposition is indicative of insanity, so any return to it is a favorable sign, however trifling the circumstance may be.

6. "Improvement, however slow, is a good sign if it be progressive. So long as this goes on, recovery may take place; but many patients improve up to a certain point and then go no farther.

7. "The age of the patient must be considered. Young people recover in greater numbers than those advanced in life. The latter recover if their insanity be melancholia; but if it be mania with hallucinations and delusions, and obscene conduct and ideas, recovery

is rare, especially if the memory is impaired and signs of approaching dementia are present.

8. "All periodicity in the disease, such as exacerbation and remissions on alternate days, is unfavorable."

Drs. Bucknill and Tuke in their manual of *Psychological Medicine* say, respecting the diagnosis of insanity, that no disease is so varied in its manifestations as insanity. That in no other diseases do we meet with such an infinite variety of light and shade belonging to their own nature, or to their intermixture with other maladies, or to the influence of temperament, of individual peculiarities of habit, or of social position, and that, therefore, the diagnosis of no other class of diseases taxes nearly so much the ingenuity and patience of the physician. The physician is compelled to bring to the investigation of mental disorders, a clear analytical conception of those functions which collectively constitute mind. The diagnosis of insanity presents itself either in a strictly medical or in a medico-legal point of view. If the question is of the former character, not alone the kind of medical treatment, but also, the question as to whether the patient has to be deprived of his liberty comes up. If the question is medico-legal, we may have to appear either in civil suits and proceedings or in criminal trials. In civil suits the distribution of property to a vast amount, the validity of wills, contracts and of other social and commercial acts often depend upon the decision of the physician; and in criminal trials the frequent issue of the question is the awful one, whether a human life shall be sacrificed with violence and ignominy, or spared by establishing the plea of not guilty, on the ground of insanity. Whether the question be purely medical or medico-legal, in its bearings and apparent consequences, the grounds of the diagnosis must be the same, for, although in criminal trials the nature of the crime itself, and the manner in which it has been effected, must often be allowed to have no inconsiderable weight in the formation of the judgment, yet, these circumstances are essentially no other than a part of the conduct of the patient; and the conduct must be carefully estimated, even when the question is most purely medical. The physician is called to see a patient whose symptoms have caused alarm and anxiety to his friends. They wish to insure both his safety and their own, and to provide immediately the treatment which affords the best promise of recovery, and above all, to have the momentous question decided for them of confinement in an asylum or of treatment at home.

The diagnostic value of hereditary tendency is great. The insanity of one parent indicates a less degree of predisposition than that of a parent and an uncle, and still less than that of a parent and a grandparent, or of two parents. The insanity of a parent and a grandparent with an uncle or aunt in the same line, may be held to indicate even stronger predisposition than the insanity of both parents. The influence of the insanity of parents in creating a predisposition will depend, to a great extent, upon whether it has taken place before or after the state of parentage commenced. The insanity of a parent occurring after the birth of a child, if it arose from a cause adequate to excite it without previous predisposition, would, of course, be held as of no value in the formation of hereditary tendency. The insanity of brothers and sisters may be of much or of little value as evidence of predisposition, according to the circumstances under which it has shown itself. If several of them, both older and younger than the patient, have become insane, the fact tells strongly in favor of predisposition, although neither parent nor grandparent may have been insane; since it is well known that other conditions in the parent, besides that of actual insanity, may create this predisposition; for instance, violent and habitual passion, the debility of old age, and most of all, habits of intemperance at the time of procreation.

The diagnostic value of previous attacks is considerable, as few diseases more frequently recur than those which affect the mental functions of the brain. A slight and transient attack, however, respecting the real nature of which there may have been some difference of opinion, will be of very different import from a prolonged attack of decided character. The greater the length of time which has elapsed since any previous attack has been recovered from, the less will be the value of it as an indication of the nature of the existing disease.

The diagnostic value of change of habit and disposition is very decided. A comparison of the present behavior and habits of his patient with those which existed in a state of health often will afford the physician a most satisfactory evidence of morbid change in the brain. The natural character of a man who is insane is either changed or exaggerated. The vagaries of hysteria in a woman must not be mistaken for actual insanity. The physician may see in his patient one of four things: first, a vacant and meaningless expression, and a childish absurdity of action, the signs of dementia, of imbecility, or those of general paralysis; or secondly, a facial expression of deep

and concentrated sorrow; or thirdly, indications in physiognomy, or demeanor, of strangeness and irregularity; or fourthly, no outward indication of mental disease.

In melancholia the patient will readily converse on his mental symptoms. In imbecility and early dementia his apprehension is not sufficiently alert to place him on his guard; and in mania, he either suffers from head symptoms, respecting which he will readily talk with the physician, or his mind is actively engaged on some project or object, which will afford the physician appropriate topics for conversation. The most difficult cases are those in which differences of opinion and of interest exist among the members of the patient's family, and the patient has been quietly told that it is wished to prove him insane and to place him under confinement, and that the doctor is coming to examine him for that purpose.

There is often a diagnostic value in peculiarities of residence and dress. The author had a case of general paralysis brought to him for diagnosis. The patient, a man of wealth, had *three* handsome neck-scarfs on and *several* valuable scarf-pins, and informed us of his desire to send us *one thousand boxes of cigars* as a present. Said he felt *magnificently*, that there were few stronger men in New York than himself. At that time he was advanced some thirteen months in the course of this intractable malady, and had the shuffling gait and the diagnostic hesitating stammering speech of a general paralytic. He was full of delusions of wealth and grandeur.

The diagnostic value of peculiarities of bodily condition is practically nothing. There may be emaciation from loss of rest, derangement of the alimentic processes, a quicker pulse than normal, and a tongue coated in the centre. The skin as a rule is harsh and dry and the complexion muddy. We frequently find disordered states of the abdominal viscera in insanity, and we may not unlikely discover gastric or hepatic disorder. Uterine disease is very frequently present. The outward expression in the patient's features and gestures of his inward psychical state of sadness, melancholy, despondency or despair, may be very striking at times. Intensified expressions are seen in insanity of the various emotions, such as pride, anger, fear, jealousy, and the patient with partial insanity may exhibit an unvarying and intense expression of any one particular emotion. In mania the attitude is restless, the motions quick and expressive of various and changeful emotions, while in melancholia the attitude is

apt to be fixed and the gestures slow. In imbecility and dementia we see slovenly postures and undecided and aimless movements.

Respecting the *physiognomy of insanity*, the extreme distortion of the features produced by acute mania, or acute melancholia, is unmistakable. There is a much greater expression of intense pain in cerebral inflammation, attended by maniacal symptoms, and a more prominent bloodshot eye than in mania alone. In the delirium of fever the countenance indicates low emotional force, while in the delirium of mania the facial expression of emotional force is highly exaggerated. If there is mobility of the facial muscles in the delirium of fever it is tremulous and feeble, indicating want of power, while in mania the play of these muscles is full of expression and power. It is vigorous and tense, indicating a concentration of nervous force. The wrinkles in the delirium of fever are the result of emaciation, while in the face of the insane man they are caused by the tense contraction of the muscles of expression. There is an apparently causeless and motionless play of features often seen in the insane.

In melancholia the facial expression is emotional. In mania it is emotional and intellectual, and marked by the above characteristics of changeableness and inconsistency. In dementia all expression has disappeared, and the physiognomy is vacant and meaningless, showing an absence of thought and desire. General paralytics exhibit trembling lips, drooping brows, and features expressive of a mingled state of imbecility and excitement, eyes with pupils of unequal size, all of which constitute a *tout ensemble* perfectly diagnostic to the experienced alienist. In primary dementia it is sometimes difficult to make a decided diagnosis. The demeanor and conduct are very slightly changed, there is nothing strange in the appearance, but a great diagnostic sign is loss of memory for very recent events. In conversing with the patient he may not be able to remember what he has been talking about a few minutes previously. Injuries to the head and apoplexy most often cause it, and fever and emotional disturbances, especially grief, will also cause it. There is absence of delusion, or hallucination. The physiognomy may be silly and meaningless, and the eyes may have a meaningless look, and there may be a vacant smile on the lips.

The patient may also lose not merely the power of understanding anything like an intricate account, but the value of very simple numbers. These facts account for the reckless expenditures of patients with recent insanity.

Acute and chronic mania, and also *incomplete mania*, may be easily recognized, or in the latter case the diagnosis may be extremely difficult, and we may have absolutely nothing but uncontrolled propensities and extraordinary conduct to guide us.

In *chronic mania*, especially with lucid intervals, we may find a remarkable strength of all the intellectual functions, in so far as they are not affected by delusions. The perceptive faculties are retained in all their activity, and the memory is very good, and even the judgment on matters unconnected with the delusive opinions and perverted emotions peculiar to the case, may not be greatly affected. The delusions may be numerous or they may be few. There is grave emotional perversion.

In *incomplete primary mania*, there may be a decidedly abnormal state of the emotions and sentiments without marked intellectual lesion. This symptom is constant. Friends and relatives are detested and abused, and the objects of natural affection overwhelmed with invective, and, perhaps, sacred things made the subject of blasphemy. This moral perversion clearly indicates insanity, but there are slighter shades of perverted emotion which require all the adroitness of the experienced alienist to discover. Absurd opinions are generally allied to perverted emotions. Exaggerated hysteria may confuse the diagnosis, and it may be mistaken for incomplete primary mania, but the age, sex, constitution, and character of the patient will generally reveal the nature of hysterical attacks when they occur. I had an hysterical patient who feigned that she had the delusion that there was an animal in her abdominal cavity, and this was in strict keeping with the tenor of her life, for she feigned everything; she, however, made a beautiful recovery by the use of the wire brush electrode with the strongest induced current. In making the mental examination we test the fundamental faculties, the attention, the memory and the judgment, and lead the patient to give an account of his own powers of body and mind with reference to health, to exercise, diet and study. Thousands of delusions are entertained by insane people upon these subjects. A conversation respecting the patient's possessions, his means of livelihood, and his hopes of advancement will lead up to delusions of pride, ambition, and acquisitiveness, if such exist, carrying the conversation on to his near relatives, and friends, birth and parentage, and the patient's belief whether his parents were his actual and real parents will lead up to delusions respecting imaginary greatness, and any perverted emotions

towards those who ought to be dear to him. His religious observances may be inquired into with the expectation of finding insane delusions on this subject. Politics and science may be made the topic of conversation with an educated man, and if insane he will hardly stand the test of discriminating inquiry on these and similar subjects. Indecorous conduct towards the opposite sex, perverted appetite and unnatural habits we must learn of from those who have opportunities to discern them.

The diagnosis of eccentricity is only likely to be brought up in cases of disputed wills or in criminal cases where eccentric conduct is utilized to support the plea of insanity. There are two forms of eccentricity. The one arising from an excess of individuality, where the individual is often endowed with more than an average portion of good sense and of moral courage, although his sense is founded upon reasons marked out by his own mind, upon propositions laid down by himself, and adverse to the common-sense of those among whom his lot is cast, and his moral courage is displayed by adhesion to his own opinions, and by setting at naught the ill-founded ridicule of the world. An eccentric man of this type is further removed from the chances of insanity than most of the sane people upon whose prejudices and fancies he sets his heel. His intelligence is not made the sport of his passions, his emotions are under control; in short, he has superior intelligence.

In the second form of eccentricity the man deviates from the ordinary observances of society from weakness of judgment, from love of applause, and the desire of drawing upon himself the attention of others. His conduct is ill-regulated and influenced only by vacillating emotions, strong or weak, according to the caprice of the hour. He has intellectual powers of low order, great desire of approbation, and little individuality. This form of eccentricity is often nearly allied to insanity, and is often premonitory to it. Its subjects are to be found in families tainted with hereditary predisposition to mental disease, and it merges so gradually and insensibly into mental disease that the lines of demarcation are traceable only with the greatest difficulty, and, indeed, often are not to be traced at all. In many cases, however, the transition is marked by perversion of the emotions; by unfounded suspicions, anxieties, and antipathies; and also by signs of physical disturbance, by sleeplessness, and general feverishness.

The diagnostic symptoms of *melancholia* are despondency, fear, and despair, existing in a degree far beyond the intensity in which

these emotions usually affect the sane mind, even under circumstances most capable of producing them, and in numerous instances existing without any commensurate moral cause and often without any moral cause whatever. The sad and anxious eye, the drooping brow, the painful mouth, the attenuated and careworn features, the muddy complexion and harsh skin, the inertia of body, the stooping and crouching postures, the slow and heavy movements, speak of distressing oppression of the faculties and intense wretchedness. In other cases fearful anxiety is observed, and the eye becomes bright, the nostrils dilated, the movements quick, irritable, and often impassioned under the influence of some vague terror. If the physician can note the above symptoms and can trace them to a cause productive of insanity, he will have little difficulty in pronouncing his patient insane, although he can discover no trace of delusion. In many cases the patient is painfully aware of the nature of his malady, and seldom attempts to conceal his consciousness of it from any considerate and sympathizing inquirer. Generally, in melancholia, there are intellectual errors displaying themselves by false sensation, perception, or conception; in illusion, hallucination, or delusion proper. There is first emotional and secondly intellectual disturbance in melancholia. Respecting the differential diagnosis between hypochondriasis and melancholia Prichard said "that a hypochondriac is in full possession of his reason, though his sufferings are not so dangerous or so severe as he supposes; but if he declares that his head or his nose has become too large to pass through a doorway, or displays any other hallucination, he has become a lunatic; his disorder has changed its nature, and this conversion takes place occasionally, though by no means so frequently as is supposed." The apprehensions of the hypochondriac are confined chiefly to his own feelings and bodily health. On other subjects they converse cheerfully, rationally, and justly, while melancholiacs view all things through a gloomy medium. The cause of hypochondriasis is generally dyspepsia or some morbid state of the digestive organs. The love of life and fear of death characterize hypochondriasis, while a frequent symptom of melancholia is disgust of life, attended with desire to commit suicide, which, when motiveless, is one of the surest marks of insanity.

The diagnosis of *monomania* is easy, from the prominence of the single intellectual error. The great majority of cases are sequences

of or transformations from melancholia. The emotional disturbance comes first; the intellectual afterward.

The diagnosis of *moral or emotional insanity proper* is sometimes very difficult. This is, according to Blandford, a disorder of mind shown by an entire change of character and habits, by extraordinary conduct and acts, extravagance or parsimony, false assertions and false views respecting those nearest and dearest, but without absolute delusion. It may follow epileptic or apoplectic seizures, or may be seen after a period of drinking. Its approach is gradual, as a rule, rather than sudden, and the extraordinary character of the acts may not at first be so marked as subsequently. Friends wonder that a man should say this or that, or should do things so foreign to his nature and habits, but some time may elapse before they can convince themselves that such conduct is the result of disease; and the acts may be such that many will look upon them, even to the last, as signs merely of depravity. Such insanity, of course, varies in degree. When it is well-marked and the conduct is outrageous there will be no difficulty in the diagnosis. But it may be less marked. It may consist of false and malevolent assertions concerning people, even the nearest; of little plots and traps to annoy others, in which great ingenuity and cunning may be displayed; and there will be the greatest plausibility in the story by which all such acts and all other acts will be explained away and excused. It would seem sometimes as if a universal badness had taken possession of the individual, yet a badness so inexplicable that it can only be looked upon as madness. Much examination and opportunity for examination may be needful before we can sign a certificate, for such people are often very acute and quite on the alert. They have no scruples about falsehood, and will deny or justify everything with which they are taxed. And where the insanity is manifested in conduct, the medical man may never be a witness of it, and is obliged to receive on hearsay that which the patient strenuously denies. Careful inquiry, however, will probably reveal the origin and cause of the change; there may have been a period, though short, of acute insanity,—as acute mania or melancholia,—which passed away and left this as a permanent condition; or it may be the precursor of a more advanced stage of insanity marked by the ordinary symptoms of delusion and hallucination. If the change has been rapid and progressive, and more and more outrageous and eccentric, it is likely that in a short time unmistakable insanity will be displayed. The

one constant and marked feature of this insanity is the absence of delusion, but we are not, on this account, to argue that the intellect is sound.

The hardest form of moral insanity to estimate and diagnose is the *congenital moral defect*—the *moral imbecility* occasionally met with in cases of this reasoning mania. These patients are utterly incapable of telling the truth or of understanding why they should do so. These are the cases that commit crimes and are very dangerous to the community in which they live. They may have considerable intellectual ability.

The diagnosis of *general paralysis* is easy to one familiar with the disease. The best symptom for early diagnosis is the modification of the articulation. It resembles the thickness of speech in a drunken man, and depends upon loss of power over the co-ordinate action of the muscles of vocal articulation. Words composed of numerous consonants, with few vocalic sounds, are articulated in a shuffled manner that is perfectly characteristic. In speaking, the lips are tremulous, as if the patient were about to burst into tears. Protrusion of the tongue is difficult, and it cannot be long protruded, and while protruded it quivers. The brows droop, and the contraction of the iris under the stimulus of light is often different in the two eyes. The voice has a peculiar tremor, and the gait is stumbling and shuffling. Later on the power over the sphincters is lost, and finally the patient may choke to death by the stoppage of food in the pharynx. The psychical symptoms are generally delusions of wealth and grandeur. There is a universal extravagance of ideas. There is loss of excito-motor sensibility.

The detection of *feigned insanity* is very important. Those who feign insanity generally overact their part. The long-continued sleeplessness of mania cannot be feigned. Neither can the restless, continued agitation; the rapid pulse; the foul tongue; the dry, harsh, inelastic skin. If the skin feels healthy and sweaty from the exertion of the pretender, and if he sleeps soundly and composedly we may be pretty sure he is feigning. Chronic mania is more easily simulated and more difficult of detection. Sibbald says, respecting these cases, that before deciding upon the reality of any doubtful case of insanity all the physical conditions of the individual, such as the amount of sleep, the state of the pulse, skin, tongue, and digestive system generally, the conduct and the state of health immediately preceding the signs of insanity should be ascertained. The effect of

remarks made within hearing of the suspected person should be observed. One who proclaims his own insanity should be distrusted.*

The diagnosis of *concealed insanity* may, at times, be made by inducing a patient to write to some friend, when things that he would not speak of he may write of at some length, and his delusion be made very apparent. A patient's conduct should be watched by night as well as by day to discover concealed insanity.

CHAPTER V.

CIVIL INCAPACITY — LEGAL TESTS OF RESPONSIBILITY — HINTS FOR GIVING TESTIMONY—EXPERT TESTIMONY, AND THE FUNCTIONS OF EXPERTS IN INSANITY.

Civil Incapacity—Legal Tests of Responsibility—Hints in giving Evidence.—Respecting the civil incapacity of an alleged insane man, Sibbald says that *the acts of any person either in or out of an asylum may, however, be declared invalid, if it can be shown that, at the time they were performed, the person labored under such an insanity as rendered him incapable of performing them rationally and without injurious consequences.* On this principle any person may be found to have been incapable of contracting marriage, of executing a deed, contracting a debt, making a will, or giving credible evidence. The principle, it must be carefully noted, is not that the mere existence of insanity in the person performing them invalidates such actions, but that if the insanity has materially affected the character and quality of the actions, they may be thereby invalidated. This is one of the most important principles that a medical jurist has to keep in mind, as it is not an unfrequent mistake to suppose that a person is necessarily incapacitated for the performance of every civil act, the moment he

* If the simulator refuses to answer all questions, refuses food, has a stupid expression of face, and remains obstinately silent, it may be at times difficult to detect the simulation. Bucknill and Tuke say that the most important diagnostic mark of feigned insanity is a want of coherence in its manifestations; their unconformity, not only with mental disease in general, but with the form or variety of insanity which is feigned in particular. The simulator mixes the forms of insanity together.

can be proved to labor under any condition to which the term insanity may be applied. Perhaps the case in which the validity of a civil act is most easily endangered by the existence of any form of insanity is the contract of marriage. This proceeding is supposed to so affect all the relations of life, that almost any form of unsoundness of mind may be sufficient to interfere with that intelligent and deliberate consideration, which is essential to the giving of rational consent. In these cases—medico-legal cases—it is chiefly important that the practitioner should distinguish, 1st. Diseased perversion of the mental faculties. This includes all kinds of insanity which are the result of active disease, such as the simple form of delirium, mania, melancholia, and monomania. 2d. Weakness or enfeeblement of the mental faculties, resulting either from defective development, disease or decay. This includes congenital imbecility, and all the forms of what is called chronic dementia, all those enfeeblements of mind which are sometimes the remaining effects of acute disease, sometimes the concomitants of chronic disease, and sometimes only the mental phase of senile decay. In order to establish the incapacity of a person said to labor under any of these forms of disease, it must be necessary that an experienced physician should not only be able to detect their characteristic symptoms, but also to show that the performance of the duties, or the exercise of the rights under consideration, would be modified or obstructed by the existence of such disease.

Marriage.—As has been already stated, the mere existence of any form of insanity in one of the parties, may render a marriage contract void.

Civil Contracts may be held binding although made by lunatics. If the person with whom a contract is made had no knowledge that the person contracting was insane, and if no attempt was made to take undue advantage of him, the contract would be held good.

Wills.—A person is considered to be of a disposing mind, that is, capable of making a valid will, if he knows the nature of the act which he is performing and is fully aware of its consequences. It is in regard to the making of wills that the law has carried out most thoroughly the principle that the validity of an act ought to be maintained in cases of insanity, unless at the time the act was performed the state of mind of the agent can be shown to render him unfit to perform that particular act in a rational manner. Persons have made valid wills while immates of lunatic asylums. And one

will was held to be good, though the testator had committed suicide within three days after its execution. The existence of delusion, which has been regarded by lawyers as of such importance in cases of alleged insanity, does not invalidate a will; for it has been declared to be "compatible with the retention of the general powers of the faculties of the mind," and to be "insufficient to overthrow the will, unless it was calculated to influence the testator in making it." [We had, recently, under our professional care, a young lady of wealth, a case of chronic mania with lucid intervals, in whom the natural affections were more than usually lively, who possessed a perfectly clear idea of the amount of property she possessed, and the way in which she proposed disposing of it in the event of her death, and whose will, as dictated by her, was as sane a document as we ever examined. Her testamentary capacity, although an incurable case of insanity, was perfectly good, and her will perfectly valid.]

On the other hand a will may be invalidated on account of the existence of mental states which would not be regarded as insanity from either a legal or medical point of view. Drowsiness and stupor resulting from erysipelas or fever, extreme weakness from cholera and failure of memory in old age, have all been found sufficient to void a will. If a physician is called on to be a witness to a will, it is his duty to satisfy himself as to the testamentary capacity of the testator. His subsequent evidence in regard to this, will, in case of dispute, be of almost decisive influence if he has taken proper means of forming an opinion. In all cases, therefore, where there may be a possibility of doubt, it is well to require the testator to show that without extraneous aid, and without referring to the document itself, he remembers and understands all the provisions of the deed.

Evidence of the Insane.—Lunacy was, until a recent date, regarded by the law as incapacitating a patient from giving evidence in court. But according to the much more extended significations which the term lunacy has received, it now includes states of mind which are compatible with testimonial capacity. Where the judge is satisfied that the lunatic understands the obligation of an oath, and can give a rational account of such things as happened before his eyes, the evidence may be admitted. But the weight to be attached to such evidence will still depend on the extent to which it fulfils the conditions commonly required to constitute credibility. It has been held, however, that when a person has suffered from an attack of insanity between

the occurrence of a transaction and the time he renders his testimony, his evidence cannot be admitted.

Management of Property.—Where persons are supposed to be unable, from unsoundness of mind, to undertake the management of their own property, it may be necessary that they should be placed under the protection of the court; but this proceeding is not usually had recourse to, unless, there is urgent necessity, or there is a strong probability that the person's incapacity will be permanent. It is resorted to principally in chronic or congenital cases, where there is no room for doubt as to the mental condition of the individual; and in cases of recent insanity, where it is necessary to have recourse to an asylum for the protection of the individual, it may also be necessary to obtain protection for his property by the aid of the court. In giving evidence or framing a statement in such a case, it is important, if incapacity is to be proved, to show that the individual has been found, when placed in circumstances requiring such capacity, unable to perform the acts which the management of property necessitates. In cases of active insanity, it is especially required to show not merely that there is delusion or other symptom of insanity, but that the insanity is of such a nature as specially to disable the person from duly performing the duties which would be required of him. Difficulties most frequently occur in cases of imbecility and dementia; but the verdicts in such cases, when disputed, will generally be found to rest rather upon the impression produced by evidence of the actual behavior of the individual than the mere medical view of his mental condition. The most effectual aid that his medical witness can render in such case, is to show whether there are or are not such peculiarities in the conduct of the person under inquisition, as are known to be characteristic of imbeciles or demented persons. In undisputed cases, where the duty of the physician consists merely in making an affidavit, there is special difficulty to be encountered. Brevity, scrupulous accuracy, and attention to the fact that such unsoundness of mind as involves incompetency to manage property must be established, are the most important requirements. In England, a person found by the court to be incapable, is placed under the control of a "committee of the person," and the property under a "committee of the estate." In Scotland, an application to the Court of Sessions for the appointment of a *curator bonis*, takes the place of the English inquisition. The chief peculiarities of the Scotch process are, that it is cheaper, more easily effected and more

easily annulled, and that it does not affect the person of the lunatic. By the provisions of a recent act, the person of an insane man in Scotland may be placed under the guardianship of the nearest male relation found competent.

Legal Tests of Responsibility.—Bucknill and Tuke say in respect to this, that although in practice the plea of insanity in criminal cases is in a large number of instances not determined according to the law laid down by judges, but according to the higher law of humanity, that it is important that students of psychological medicine should know what unfortunately continues to be the main legal test of responsibility in criminal cases,—the consciousness or knowledge of right or wrong; instead of being, as it should be, whether in consequence of congenital defect or acquired disease, the power of self-control is absent altogether, or is so far wanting as to render the individual irresponsible. As has again and again been shown, the unconsciousnes of right and wrong is one thing, and the powerlessness through cerebral defect or disease to do right is another thing. To confound them in an asylum would simply have the effect of transferring a considerable number of the inmates thence to the treadmill or the gallows.

For cases in which the prisoner was acquitted on the ground of insanity, although knowing the nature and quality of the act and quite conscious of the difference between right and wrong, the reader is referred to Taylor's *Medical Jurisprudence*, 4th ed., p. 768. For cases in which the plea of irresistible impulse was admitted, see p. 760, also p. 262–3 of Bucknill and Tuke's *Manual of Psychological Medicine*, 4th ed. Also refer to "the case of Henry Galbites," by Dr. Kitching (*Journal of Mental Science*, July, 1867); the same writer's lecture on moral insanity (*Brit. Med. Journal*, 1857); "The Legal Doctrine of Responsibility in Relation to Insanity," by S. W. North, M.R.C.S. (*Transactions of the Social Science Association*, 1864); "Insanity and Crime," by the editor of the *Journal of Mental Science*, 1864 (Townley's case); "Étude Médico-légale sur la Folie," par M. Tardieu, 1872; the work of Esquirol and Marc, Brierre de Boismont, De la Folie, Raisonnante, etc., 1867; "De la Monomanie de Persecution au point de vue de la Médecine légale" (*Ann. d'Hyg.*, pub. 1852), and Lasègue, "Memoire sur la Délire des Persecutions" (*Arch. Gen. de Méd.*, tom. 27). A case of delusion of persecution ending in homicide and acquittal, in which the judge's common-sense and humanity got the better of his law, will be found in the *Journal*

of Mental Science, for July, 1872. For cases proving the presence of the homicidal *impulse* without other symptoms of insanity, see article by Dr. Needham in the same number; and for the important cases of Edmunds and Watson, see April, 1872. For case of insane infanticide and the judge's summing up, see April, 1871. Mr. J. B. Thompson's article in the *Journal*, January, 1870, and also the succeeding one in the October number, which should be read in connection with Despine's work, *Psychologie Naturelle*, 1868.

Hints in Giving Evidence.—Bucknill and Tuke say respecting this part of medical jurisprudence:

1. That a medical man is obliged to make known, if asked in court, the statements or confessions made by a patient to him (*Peake on Evidence*, p. 88; *Starkie on Evidence*, p. 105; *Shelford*, p. 81).

2. If a medical witness believes a criminal to be insane and is called upon to give evidence to that effect, he must not be content with stating his opinion, but must be prepared to state the reasons upon which that conclusion is based. For aid in arriving at a judgment the reader is referred to the chapter on the Diagnosis of Insanity.

3. The medical witness should confine himself to a simple statement of facts, and not allow himself to be drawn into a metaphysical discussion, or an attempt to define insanity.

4. If a medical witness sometimes wishes to fortify his view of the case by inducing the counsel to read from medical works, and the question arises whether this can be legally done. It has been decided in one case that "counsel was at liberty to read as part of his speech, the opinions of a medical work, but the jury would not have to decide the case upon medical criticism, but upon the case and the facts." The counsel in the case alluded to then read from a book on medical jurisprudence, in order to show that certain cases recorded there were similar to the one before the court. It would appear, from R. *v.* Crouch, 1 Cox, C. C., 94, that the *opinions* of a medical writer cannot be stated in an address to the jury, but the judge in the case alluded to did not distinguish between these and *cases*.

5. In regard to any notes the medical witness may have taken of the prisoner's state, he may only make use of those in court which he has committed to paper at the time he examined the prisoner.

6. It must not be forgotten that the prisoner may be sane when examined by the physician, and yet may have been insane when he committed the deed, and *vice versa*.

Expert Testimony and the Functions of Experts.—Many of the community, as the late Dr. Ray has shown, completely ignore the exact purpose of skilled testimony in a judicial proceeding and the functions of an expert. They are apt to bring forward the timeworn objection to expert testimony, viz., that as the experts are engaged by one or the other of the litigant parties they thus necessarily testify under a bias, and consequently are not trustworthy. This would imply that there is a distinct understanding as to what any given expert shall say, before he has heard a word of the evidence on either side. An expert's opinions, as Dr. Ray has said, are worth money, but it does not follow that his opinions are corruptly bought. Why should a fair reward for professional services obscure an expert's perception of truth? Experts necessarily, according to the present law, which we hope to see reformed (see chapter on "the necessity for a reform in the introduction of expert testimony where insanity is alleged as a defence"), testify in the interest of a party; but that fact Dr. Ray conclusively proved does not imply an unworthy bias. The counsel lay before the expert the evidence to be produced before him as far as they can, and the honest expert invariably tells the counsel either that if he can prove the facts as he states them he has a good cause, or he tells him that even if he does prove such facts they would not warrant the construction he wishes to put upon them, and that his—the expert's—testimony would not help him. Generally speaking, it is as Dr. Ray said, that if an expert's testimony is wholly and unconditionally in favor of one side only, it is merely because this result is warranted by the facts. An honest expert will moreover warn the counsel that the evidence as brought out on trial may oblige him to modify his opinion.

An expert is one who gives his time and attention entirely to a particular pursuit, and he is, therefore, to be recognized as an expert in questions relating to that pursuit, to the exclusion of those who have attended to it incidentally as a subordinate part of a more general department of inquiry.

The functions of an expert are to appear in court to give an opinion, based either on his acquaintance with the party whose mental or physical condition is under investigation, or upon a medical examination of him which he has made, or upon a hypothetical case stated to him in court. The expert is wanted in court to give his opinion on facts proved or upon a case hypothetically stated. *An opinion,* I should define, as *the statement of what certain facts indicate to*

the expert himself. Therefore, on a trial, I do not think an expert should give his opinion upon facts proved by a witness unless he hears all the testimony of such witness. The old practice where the expert heard all the evidence given at the trial, and then was asked for his opinion founded on that evidence, supposing it to be true, was, I think, better calculated to elicit a well-considered opinion than the new change, where the counsel on each side, out of the facts that have appeared in evidence, construct a hypothetical case as fairly as will best serve their purpose, and no more. In such cases the expert may be obliged to assent to the propositions of both sides, as Dr. Ray has shown, and thus apparently stultify himself. This is due to a twisting and coloring of facts. Sometimes unfortunately the manner in which an expert's opinion is elicited is deliberately calculated to overwhelm it with discredit. Able counsel use all their professional astuteness to deprive of its proper weight with the jury, says Dr. Ray, the most honest and truthful expressions of opinion, and if we had a healthier public sentiment which would make the judge keep a cross-examination within its proper limits and restrain the license of counsel, the public would have less reason for distrusting and sneering at expert testimony. The judge's question to determine whether a witness offered as a mental expert has the legal qualification to entitle him to testify as such should be: "Do you give your time and attention entirely to a particular branch of medicine, and is that mental or psychological medicine?" This, and nothing else, is needed to constitute an expert in mental medicine. He should then in any given case, give his opinion on the case from the examination he has made; his observation, experience and professional reading. He necessarily forms an opinion from this combination.

Dr. Ray recommended, in 1873, that the testimony of experts be given in writing and read to the jury without any oral examination. It would thus, he said, be deliberately prepared, its explanations well considered, and its full force and bearings clearly discerned. It would go to the jury on its own merits, no advantage being gained by either party by the superior adroitness of counsel in embarrassing the witness and pushing his statements to a false or ridiculous conclusion. It would work no injustice to either party, and it could be managed without additional inconvenience. There could be no difficulty in civil cases where both parties consent to such an arrangement. Dr. Ray says: "Judges should not, as they sometimes have been known to do, disregard their proper functions and assume the

part of an expert, and, in cases of disputed sanity, pronounce a man to be sane and safe to be at large in spite of the declarations to the contrary of men long conversant with the discourse, conduct, ways, and manners of the insane." The whole subject of expert testimony needs to be lifted up to a higher plane than it now occupies, by the mutual efforts of lawyers, physicians, and public sentiment. The revolution in the management of the insane has produced among its legitimate effects a better knowledge of insanity. Respecting written testimony I would add that in the celebrated Parish will case, reported by Ray in his *Contributions to Mental Pathology*, p. 316, where Henry Parish, a prosperous New York merchant, made his will in 1842, being then fifty-four years old, on trial the surrogate wisely determined that the opinions should be given in writing, with the understanding that, though not clothed with the authority of legal evidence, they would be carefully considered and credited with all the weight to which they were really entitled. This enabled the expert to utter, as Dr. Ray showed, what is impossible in the usual method of examination and cross-examination, his opinions and the reasons for opinions, with that coherence and logical relation absolutely necessary to show their full force and significance. Mr. Parish made his will, in 1842, disposing of some $750,000. He went to Europe in 1843, and had an apoplectic attack, from which he shortly recovered and continued as well, apparently, as ever, both in body and mind, until the 19th of July, 1849, when he had another apoplectic attack, much more severe. In about a fortnight he was out of immediate danger, but never recovered his ordinary condition. His right side, including the upper and lower limbs, was found to be somewhat paralyzed; the power of articulation was lost; and his natural elasticity and vigor were gone. These traits continued with little change until he died, in 1856. Epileptic fits occurred within a few months of the apoplectic attack of July, 1849, at intervals ranging from eight days to six months or more. On the 29th of August, 1849, he subscribed his cross in lieu of a signature to a codicil to his will. On the 15th of September, 1853, a second codicil was subscribed in like manner, and on the 15th of June, 1854, a third codicil, substituting his wife in place of Daniel and James Parish as residuary legatee. These codicils were contested in the Surrogate's Court on the ground that when they were made the testator had not a testamentary capacity. His mental condition during the period between the attacks in 1849 and his death in 1856 was that of but a small measure of mental

capacity. He was reduced to an almost vegetative existence. There was ample proof of mental infirmity, of dementia, or imbecility. He was plainly an insane man, without mind enough left to constitute testamentary capacity.

CHAPTER VI.

GENERAL PARALYSIS OF THE INSANE.

(Syn.—*Paralytic Dementia; Progressive General Paresis; Paralysie general des aliénés.*)

In writing on this very interesting form of mental disease we may define it as a disease characterized by general and progressive loss of co-ordinating power over the muscles, especially those of speech and locomotion, combined with mental enfeeblement, always tending to dementia, and characterized by a sense of well-being or actual delusions of an exalted character. It is doubtless true that, in certain states of the brain, mental action or the actions of the higher centres of the brain may become at times automatic, and be performed without the intervention of consciousness. A constant repetition of any given mental action causes it to become organically registered in the brain centres, so that while at first a series of thoughts is performed consciously by the individual, it ultimately becomes reflex, responding to the recognized stimulus without consciousness and independent of any effort or intervention of consciousness. It is to some injury of this mind-power that we must look for an explanation of the mental symptoms of general paralysis.*

Two classes of mental actions will necessarily be involved in this disease. First, those which are of so recent an origin as not to have become organically registered; and second, those which are still unable to be performed without conscious interference. One of the

* General paralysis may be due to excessive mental labor, great anxiety, alcoholic or venereal excess, or to any great and continued strain upon the centric nervous system. Blows on the head and sunstroke may produce it, and it attacks by preference males between thirty and fifty years of age. Sleeplessness, restlessness, depression followed by exaltation, enfeeblement, and extravagance of thought and action are early and marked symptoms.

most prominent instincts or ideas in the human mind is the importance of self. In a healthy state we draw up and surround ourselves with an ideal self which, if we are healthy-minded, finds no expression. If the power to which all mental processes are due be impaired, those actions, among others, will be affected which are the most detailed and elaborate, the most varied, the least rigidly defined, and the least organically registered. Of all mental processes those involved in the consideration of self are at once the most general, extensive, and complicated, as well as the most vague and undefined. Self occupies in the mind the widest, most frequent, and most capricious attention. As in general paralysis this mind-power is the seat of the main lesion, the psychical processes concerned in the consideration of self will be the first involved, and will present the most prominent symptoms. In general paralysis the ideal self runs riot; the man is not as he is, but as he has pictured himself and as he would have himself be. In the inception of his disease the patient feels himself "bang-up" and "perfect." Everything is "elegant" and rose-colored. His wealth is unbounded, and he orders "a million" cigars and orders palaces built of gold and diamonds with the utmost indifference and nonchalance, thoroughly believing in his capacity to do all these things. The patient's delusions are markedly progressive in number, absurdity, and exaggeration. Being rather feeble, he imagines himself capable of immense sustained exertions. In general paralysis the mental processes which are the most automatic are the last to be affected, and the patient entertains perfectly reasonable ideas about his actual self, and, although possessing thousands of ideal dollars and estates, will tell you correctly that he earns but ten dollars per week, as this idea has, from frequent and constant repetition, become automatic. In the same manner a patient under my care tells me correctly that his suit of clothes cost him fifteen dollars in London, and in the same breath says that he has ordered a silk-velvet suit with diamond buttons. At the present moment he considers his health perfect, but acknowledges that in the past he has had many sicknesses and infirmities. Matters of recent occurrence, which have not had opportunities for repetition, and so have not become organically registered and automatic, and that consequently involve consciousness, are far more dependent upon mind than matters of earlier date which have been so frequently repeated as to acquire automaticity. The patient, therefore, while stating with accuracy events and detailed accounts of the past, can give but a very

vague and confused account of the events of the last few days or weeks. This defect in memory is consequently one of the most noticeable symptoms in the early stage of the disease, and we observe it particularly in persons of methodical habits. Leaving this interesting field of the psychology of general paralysis, we proceed to notice its pathology.

Pathology of General Paralysis.—The pathology of general paralysis is very obscure, and invites especial attention at the hands of the profession. Dr. Magnan, a distinguished physiologist and psychologist, the superintendent of a Paris insane asylum, considers that the fundamental lesion of this disease is a generally diffused interstitial encephalitis, which involves accessory structural changes of various character. He regards the primary and most palpable form of the interstitial degeneration as colloid, where the transformed matter is presented under the aspect of a hyaline substance, semi-transparent, slightly refractory, and at certain points of a bluish tint. When existing in isolated masses of small size, it preserves the form and aspect of whatever cerebral elements it may have invaded. This product of inflammation, which Dr. Magnan does not claim to be tubercular, is not of a fatty nature, because insoluble in ether or chloroform. It is not amyloid, because unaffected by tincture of iodine or solutions of potassa and soda, and is dissolved in strong acetic acid. It is not organic, as there is no reaction with hydrochloric acid. Its solubility in hot water, especially when potassa or soda is added, is supposed to establish the possession of a peculiar chemical composition. In examining the cerebrum as the principal seat of paresis, Magnan claims priority in having determined the ependyma of the ventricle as the centre, or perhaps one of many centres, of that destructive process which is indicated by the symptoms of general paralysis, which affects all parts of the encephalon and produces those secondary pathological appearances that have previously been identified as the cause of the disorders of mobility and sensibility. The progress of the morbid degeneration from the point where the ventricles have become dilated, their ependyma thickened, when their surface, especially in the fourth ventricle, is covered with granulations, is probably upwards along the connective as well as involving all tissues, and is gradual and insidious, and can only be traced by the more advanced alterations in structure. (It is proper to state here that Dr. Boyd, late physician and superintendent of the Somerset County Lunatic Asylum, in England, disputes Dr. Magnan's claim

to the priority in the discovery of the pathological changes in general paralysis, calling attention to his observations, made about thirty years ago, in the second annual report of the Somerset County Asylum.) This interstitial irritation of the brain in general paralysis, however it is disseminated, is propagated by nuclear proliferation, and invades the white matter in common with the cortical substance, and also the capillaries, which are thickened, tortuous and massed together. The cells of the cortical portion are sometimes found infiltrated with granulations, but preserving their form. This is found in the third stage of the disease. It is in the middle and inferior portions of the gray matter that the cells are observed to have brilliant nuclei tending toward colloid, while their normal aspect is preserved. The walls of the cells nearest the lesion are transformed into a shining, refractory, hyaline substance, the colloid infiltration having been propagated to both. The microscopic, as well as the naked-eye appearances, may appear first in the brain and subsequently in the medulla, or they may appear first in the medulla and afterwards in the brain; and they may also appear in both simultaneously. If the brain is primarily attacked the psychical signs predominate or are exclusively manifested. If the medulla be the primary seat of the disease, muscular pain, tremor and ataxic symptoms, spreading gradually to the lips and tongue, disturbance of the internal viscera corresponding to the portion of the spinal column involved, precede alienation and increase the difficulty of diagnosis. Finally, when the whole cerebro-spinal axis participates at once in the colloid degeneration, the characteristic indications of paresis will appear simultaneously or in rapid succession. It is important for us to bear in mind that the colloid degeneration upon which Magnan insists is far from being constant in paresis, and we meet with it in other diseases remotely connected, or perhaps in no degree connected with paresis. For instance, the ependyma of the fourth ventricle has been found to be the seat of the same changes as in paresis after muscular atrophy, chronic alcoholism, senile dementia, tetanus, and also after tubercular meningitis. I will now cite as concisely as possible the opinions of the highest authorities relative to the pathology of the disease under question. Bayle designated the disease chronic arachnitis. Calmeil considered it as a diffused chronic periencephalitis, and held that it was of inflammatory origin. Baillarger observed two sets of anatomical alterations, congestion of the membranes and chronic hydrocephalus, with atrophy and softening of the brain. Burnet and Lancereaux speak of a neo-membrane, or a pachy-

meningitis, the formation of which they explain by the exudation of a parietal layer from its walls, which is insensibly organized and which bears the marks of fatty degeneration. The rupture of these vessels leads to the occurrence of arachnoid cysts. Erlenmayer explains the atrophy which has been noticed by the successive and repeated effusions of serum, the nervous elements being replaced by an amorphous substance. Frerichs considers the induration of the gray matter as connecting the pathological condition with sclerosis. The alterations in the white matter consist of hardening or softening, increase of fluid of the ventricles and thinning of their parietes, which resemble indurated ependyma. M. Luys, a very able French investigator, believes that in the softening of the cortical substance of the cerebellum may be discovered the source of general paralysis, but Magnan asserts that this conviction of M. Luys is founded on exceptional cases. M. Luys gives as the result of his microscopic investigations the following results, viz.: The vessels of the pia mater are of considerable size, the walls of the capillaries incrusted with granulations, the surface of the pia mater presenting scattered cell-granules and molecules and extravasated blood-globules. The gray substance is greatly developed, with palpable vascular arborizations, often in the form of a plexus. The calibre of the capillaries is almost always contracted by the incrustation of minute granules, or by cells, deposited chiefly at the bifurcations, which are of irregular shapes and break down and discharge their contents. The nerve-tubes are malformed, their contents escape, and they present little more than a mass of débris.

Rokitansky has detected three distinct pathological appearances: 1st. Where a mass of connective tissue embraces in its network the nervous element, and in chronic cases is stiff, fibrous, and induces adhesion of the pia mater. 2d. The tubes are varicose and broken, while the cells appear swollen. 3d. The presence of amyloid or colloid bodies. Wedl's observations are as follows: That contraction of the capillaries and small bloodvessels, in consequence of the cells upon their walls, leads to obliteration, their conversion into bands of connective tissue, and the consequent impairment of the nutrition of the part. Dr. Ertzbischoff attributes the hyperæmia of the cortical layers to the extreme development of the embryoplastic element in the capillaries, which, by compressing the vessels without and within, diminishes and ultimately destroys the cavity. This stasis necessitates granulations and adhesion. The majority of the German pa-

thologists localize the disease in changes of the walls of the vessels and in the development of the connective tissue. Meschede sees the essential characteristics of paresis in the degeneration of cerebral cells, especially those of the cortical substance, which he depicts as of abnormal shape and filled and surrounded with fatty and pigmentary granulations. Lockhart Clarke speaks of the conversion of the cells of the convolutions into pigmentary bodies, irregularly shaped and about to break up. Contemporaneously with this change, the spinal marrow, especially in chronic cases, is softened to the consistency of cream, or there may be a granular degeneration in its gray matter or in its surroundings. Westphal has discovered in some cases granulations in the posterior columns of the spinal cord, which did not extend higher than the peduncles of the cerebrum, so that the alteration could not be regarded as secondary, or as proceeding from the pathological condition of the convolutions.*

The course of general paralysis may very properly be divided into four stages:

1. That of delirium, with or without slight physical lesions.
2. That of defective co-ordination of movement, exaggerated sentiments, alterations in the secretions, with continued delirium.

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* Although we have the greatest respect for the opinions and observations of all the distinguished observers we have mentioned, we think they have all paid too little attention in their researches to the condition of the spinal cord in general paralysis; our own investigations have been limited to perhaps too few cases to draw forcible deductions from, but they have convinced us, personally, that whether primarily or secondarily to cerebral change the spinal cord is *always* affected, and that the changes in it are constant and peculiar. We think these changes often primary. We call attention to one of the micro-photographs in this work, showing atrophy of nerve-cells of the posterior columns, with plates of new connective tissue of irregular size. The lateral columns are also affected in their posterior section; and the posterior columns and the posterior part of the lateral columns may be unitedly affected. We also call attention to another micro-photograph depicting a change not unlike that we meet with in myelitis, with marked softening, evidently succeeding an inflammatory process of the posterior cornua. We think *decidedly* that pathological conditions of the cerebral capillaries are phenomena *primary* to the morbid changes in the cerebral cells in this disease; but it has not seemed that the cerebral changes were so invariable and constant as the spinal; and we think careful observation will in the future show shrinking and atrophy of the spinal cord. We think the changes in the brain congestive and hyperæmic and not generally inflammatory, and we think the psychical symptoms are immediately dependent upon the disturbances in the circulation, which accelerates, impedes or interrupts the nutrient supply of the cerebral cells. We see first, exalted functional excitability and activity, and secondarily, destruction of this excitability and activity with dementia, indicative of degenerative changes in the brain-cells.

3. That of special dementia, with greater stupidity and degradation than in other forms, the control of muscles diminished, habits dirty.

4. Perception of impressions by external senses abolished; insensibility to pain; extinction of functions of relation and organic life; disturbance in circulation; complete adynamic ataxy and marasmus.

Optimism and ambitious ideas, as I remarked in the first part of this chapter, constitute the essential mental characteristics. Previous to the establishment of complete delirium or delusions there may be traced deviations from healthy mentalization, which, though faint or latent, should be accepted as prodromata. There is no doubt that the gradual evolution of physical and psychical symptoms corresponds intimately with structural alterations in the nervous centres. Owing to having employed galvanization of the cervical sympathetic nerve with temporary beneficial results in some cases of general paralysis, the following question has presented itself to my mind: Whether some of the principal changes occurring in general paralysis may not have their origin in a congestion originating in the ganglia of the sympathetic, transmitted along the spinal cord, ultimately involving every tissue within the cranium, and eventuating simultaneously in the degeneration of bloodvessels, cells, and nerve-tubes, and the mental and motor perversions which distinguish in so marked a manner general paralysis from all other diseases of the same class? The diagnostic symptoms of general paralysis, aside from the exalted notions, are difficulty in articulation, with a trembling of the tongue when the attempt is made to protrude it beyond the teeth, often a turning to one side and a general inability to use it freely, as if it were too large for the mouth or too heavy for use, very flabby, and easily indented by the teeth; a peculiar dragging of one of the feet or legs; and added to these symptoms will be found a heavy, dull expression of countenance, and an unusual appearance of the eyes, and, almost invariably, an unequal contraction of the pupils. It requires careful observation to detect these symptoms in the early stages, and careful treatment may relieve them temporarily; but although we may retard the issue of the disease by careful watching and skilful treatment, it inevitably advances insidiously to paralysis of the tongue and limbs and progressive enfeeblement of the mind. In the last stages, which sometimes last for years, emaciation succeeds obesity. Sometimes there is intense restlessness, but generally we find lethargy of body as well as of mind, this lethargy being disturbed by twitchings or epileptiform convulsions. These often ter-

minate life, but the most frequent causes of death are sheer exhaustion and tubercular disease. With regard to the condition of the retina, we find the nerve changes generally proportionate to the contraction and dilatation of the pupils, the contraction of the pupil corresponding to the early or the hyperæmic stage, and the dilatation of the pupil to the white atrophic condition of the optic disk. With regard to the temperature, I have always noticed, as an unvarying symptom, that there is always a higher temperature in the evening than in the morning. Seldom less than one degree, and, in excited cases, sometimes a difference of two degrees, and we may, by the thermometer, discover the progress of the disease when we cannot do it satisfactorily by any other means. In sleepless and destructive cases the temperature is higher than it is in quiet cases. We may consider the average duration of general paralysis as about thirteen months, and very few patients live more than three years after the development of well-marked symptoms.

Dr. Auguste Voisin, in his *Traité de la Paralysie Générale des Alienes*, says that in the first period of general paralysis the principal, persistent, and most valuable symptoms may be said to be:

1. Loss or diminution of the sense of smell.
2. Tremulous speech.
3. Fibrillary twitchings of the lips and the facial muscles.
4. The pupillary phenomena, and
5. The existence of fever.

The points he makes in regard to the temperature are:

1. That in general paralysis the average temperature is below the normal.
2. That every eight or fifteen days it rises above the average.
3. That it stays above the normal mean sometimes for only one day, sometimes for many days consecutively.
4. That in cases in which this elevation of temperature continues for several days the elevation of temperature is always highest in the evening.
5. That the increase as well as the decrease of the temperature is sudden.
6. The figure indicating the temperature is never high. It rarely attains 102.2° F., and more frequently is between 100.04° and 100.4° F.

The psychic changes are only an exaggeration of those of the prodromal and intermediate periods. Sometimes there is no delirium,

but only an enfeeblement of the intellect and perversion of the feelings, but in others, and the majority of cases, there is either the ordinary expansive mania, so often described by writers on this disease, or a melancholic form, recognized by Falret, Calmeil, Pinel, Lunier, Baillarger, and others, and which is hardly ever found with the same characters in any other disorder.

The melancholic type of mental disorder is to be separated in five special clinical forms:

a. Melancholia with agitation, which is distinguished from a similar state in other forms of mental disease by the elevated temperature.

b. The melancholia with stupor, the patient not preserving the obstinate silence nor presenting the facial muscular contraction usual in such cases with other relations.

c. Religious melancholia; a rare form.

d. Melancholia with ideas of persecution, and sometimes

e. Ideas of poverty, in which the patients refuse to eat because they are too poor or because food is too dear.

Voisin also makes three varieties of the hypochondriac form of depression, viz.:

a. The denial of the possession of certain organs.

b. The negation of existence, and

c. Micromania, or belief of the patients that they are infants or children.

The suddenness of the appearance of these forms, their absurdity, and the variable character of the delusions, as in other forms of mania, in paralysis, he thinks sufficiently separate these varieties of hypochondria from the non-paralytic forms. Voisin recognizes five varieties of general paralysis:

1. The acute and rapid form (acute periencephalitis).
2. The ordinary form, with grand delirium.
3. The senile form, characterized by progressive enfeeblement of the intellect, and of long duration—six, eight, and ten years.
4. General paralysis with all the characters of dementia. (Voisin's own discovery.)
5. Spinal general paralysis, or paralysis without alienation.

M. Auguste Voisin takes an altogether more hopeful view than is generally held by the profession of the curability of general paralysis, even in confirmed cases, and reports ten cures on record. The best plan of treatment he considers to be exercise, the prohibition of

mental labor, bromides and cannabis indica, leeches to the anus, purgatives in first and second stages of the disease, and also sinapisms and warm foot-baths. He also recommends blistering the scalp and nucha, actual cautery along the spine, and cold baths *par excellence*.* I have given a full description of M. Voisin's ideas relative to general paralysis, because of the deep interest which pertains to this rebellious form of mental disorder, and because of my sincere admiration of his masterly handling of this difficult subject.

In closing this chapter on general paralysis there are three questions which are very interesting to psychologists, and to which I would invite their attention:

1. Are the psychical excitement, exaltation, and delusions of general paralysis to be regarded as the factors or promoters of the physical degeneration?

2. Are we entitled to hold, in remissions in general paralysis, that the physical degeneration was stayed or disappeared during the cessation of mental disease, giving place to healthy structure?

3. Are we entitled to hold, in general paralysis, that the resumption of apparently healthy action was compatible and coexistent with persistent structural degeneration?

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* In our own treatment of general paralysis we employ centric galvanization, cold baths, and we think highly of the following pill, to be administered every two hours. It calms nervous excitability and supports the vital powers.

℞. Zinci Valerianat., ... ℥j.
Ext. Belladonnæ, ... gr. iss.
M. et ft. pill No. xxx.

At night, if the patient is sleepless, we give the following, the dose to be repeated in one hour if the patient is not asleep.

℞. Chloral Hydrat., ... ℈ij.
Sodii Bromid., ... ℥j.
Morph. Sulph., ... gr. ¾.
Syr. Zingib,
Aquæ, āā, ... f℥j.
M. et ft. sol. S. Tablespoonful at bedtime.

CHAPTER VII.

IDIOCY—DEMENTIA—FOLIE RAISONNANTE.

(Syn.—*Moral or Affective Insanity.*)

An idiot, according to Lord Coke's definition, is "one who from his nativity, by a perpetual infirmity, is *non compos mentis.*"

Idiocy is a condition in which the intellectual faculties have never been developed sufficiently to enable the idiot to acquire such an amount of knowledge as persons of his own age, and placed in similar circumstances with himself, are capable of receiving. This latter is essentially Esquirol's definition of idiocy. The progress of modern science is such, however, that we no longer believe that the faculties of the idiot must remain stationary. In idiocy there is an impairment of the functions of organic and animal life. Any of the special senses may be more or less involved. There are various degrees of idiocy, from the idiot who exhibits nothing beyond reflex action to those whose ideas produce some intellectual operations and consequent will. In deciding whether a child is idiotic we must examine the special senses, sight, hearing, smell and taste, the general aspect of the child, the form of the head, whether microcephalic or hydrocephalic. Most cases of idiocy present more or less malformation of the skull. The ears should be examined, as in idiocy they are large and ill-formed. The eyes in idiocy have a vacant stare and do not follow objects held before them. The hand of an idiotic child will not grasp your fingers properly. The grasp is feeble and powerless and the hands are cold and blue. If old enough to talk, notice the character of the vocal sounds.

In the treatment of idiocy we must rescue the child from a solitary life and surround him by influences calculated to make existence pleasant. "We must attain to the happy combination," says an eminent authority, "of medical, physical, moral, and intellectual treatment." The highest possible health is the great desideratum. The dietary must contain a fair supply of nitrogenous elements, and at the same time be rich in oleaginous and phosphatic substances. The daily use of sponge baths is of paramount importance, as there is a peculiar exhalation from the skin of imbeciles. As regards physical training the attenuated muscles should be carefully and fully exercised, to obviate the simple automatic movements so common to the imbecile and idiot. The moral education must inculcate

obedience, although corporeal punishment should never be resorted to. The idiot should be made to understand that right is productive of pleasure, and wrong followed by the reverse. Study the peculiarities of the patient, and you can then control him morally. The intellectual training must teach the idiot the qualities, form and relation of objects, by the sense of touch; color, size and shape by the sense of sight, and the varieties of sound by the ear. The idiot must be taught habits of neatness. Imperfect speech is best overcome by a series of tongue gymnastics. We must provide varied amusements, especially of an object-teaching character, and we can get good results by patience and perseverance.*

Dementia.—The chief moral cause of acute or primary dementia is mental inanition or monotony of thought or feeling. If our mental food is not varied it ceases to nourish us, and we pine into dementia. Acute dementia follows exhausting disease frequently, and right here let me say that at such times, to prevent brain wasting, the chlorophosphide of arsenic (Routh's formula) is invaluable, in doses of five drops in water, gradually decreased to two drops, three times a day, and persisted in for months. Acute dementia begins in one of two ways, either gradually, by imperceptible encroachments, or by maniacal excitement. The acme of dementia is a mental state of profound stupidity. The pathology of dementia is generally a venous congestion which affects the whole encephalon, but the frontal and parietal lobes are chiefly implicated. The vessels are œdematous from the accustomed want of tone; this causes pressure on the brain, and if of long continuance atrophy results. Acute dementia, therefore, is a disease of venous congestion.†

* J. Langdon Down very truly says of idiocy that the lesion is not only a psychical one, but profoundly affects the physical and frequently the moral life. The stature is less than normal, with great tendency to assume a stooping posture. The circulatory system is weak, the lungs liable to inflammatory attacks, the gastro-intestinal tract liable to derangement, the sexual functions often abnormal, the motor functions are abnormal; there is diminished sensibility, speech is defective, sight defective, sense of smell is lessened, and no discrimination of odors; the faculties of observation and attention are limited; there is very little imagination or power of abstract thought. We may classify it into 1. Congenital; 2. Developmental; and 3. Accidental idiocy. The first class exhibit signs of defective mental power at birth. The second class manifest an average intelligence through infancy, but break down during one of the developmental crises, these being the first dentition, the second dentition, or at puberty. The third class are born with a normal nervous system free from defect, but a fall, a fright, epilepsy, the sequelæ of measles, scarlet fever, meningitis, etc., may lead to a mental break down and *accidental* idiocy.

† Primary or acute dementia may be accompanied by the most profound vacuity, according to Blandford, and abeyance of all the mental faculties, and yet yield to treatment,

Folie Raisonnante, Synon., Moral or Emotional Insanity Proper.—There are equivocal states of mental alienation or so-called reasoning insanity (folie raisonnante), which may exist alone and disappear before the appearance of the ordinary attack. The slightest form of folie raisonnante is that in which the patient is more or less aware of the morbid conception. If he conceals it we are unable to detect it; if he acknowledges it, it is in such a way that we hesitate to believe him insane. A more decided form is that in which the patient is just conscious of his insanity. He accepts the insane notion, but understands that it is for his interest to hide it. Still farther along the same patient does not conceal his delusion. Those patients who remain very long in an uncertain mental condition are those who most frequently manifest abnormal forms of insanity. There are prolonged lucid intervals in every kind of mental alienation. Between reason and confirmed insanity there is every shade of reasoning power.

Bucknill and Tuke say in speaking of these cases that "they are mainly of a destructive character, and may be distinguished from emotional disorder of a melancholy and exalted character by the term 'emotional insanity proper,' or moral insanity."

There are congenital cases of defect or disease of the moral faculties, and others in which this condition of mind comes on or is first exhibited in adult life. Respecting the former class of cases Bucknill and Tuke say: "The most striking feature of insanity in general, and the strongest proof of the presence of any of its forms, is the change which takes place in the individual's character and habits." To cases of congenital deficiency of the intellect, however, whether altogether idiotic or only partially imbecile, it is at once manifest that this test does not and cannot apply. In such instances the natural character is itself in an abnormal condition, and ceases to be the standard of health. This observation applies with peculiar force to

leaving the patient sane. The patients are young persons—boys and girls. There is a collapse of all mental power; the face is vacant, with a fatuous grin, and often the saliva dribbles continuously and the patient has to be tended like a baby; the hands and feet are blue with cold; the tongue is pale and flabby, and the pupils are dilated. Dementia is more often secondary; that is, occurring after mania, melancholia, monomania, than primary. We have in primary dementia a rapid suspension of the intellectual, moral and instinctive faculties—a state which is curable. In treatment abundant nutrition, stimulants, warmth, mild exercise, cold baths or the shower bath, the patient standing in warm water, central galvanization, and iron and quinine, or a combination of iron, phosphorus, zinc, and strychnia, are all indicated to restore lost nerve tone. Ordinary dementia is very incurable.

the matter now under consideration. If there ever be, congenitally, a condition of the moral sense analogous to imbecility, it is impossible to apply, in such instances, the test referred to—a test which is alone applicable to mental disease when acquired. We have seen several well-marked examples of lunatics, who, on arriving at manhood, were placed under restraint, because age brought with it a certain legal responsibility, the absence of which, in early life, rendered the patient's friends willing to content themselves with their own surveillance. In such cases, parents assert that the child, the boy, the young man, alike presented the symptoms of an inert moral nature, and of an activity of the animal propensities, over which threats, rewards or punishments exercised a very trifling control.

There was a patient formerly at the Richmond Lunatic Asylum, Dublin, whose case illustrates this class. We are informed that "he exhibited a total want of moral feeling and principle, yet possessed considerable intelligence, ingenuity and plausibility." "He has never," says Dr. Crawford, "been different from what he now is; he has never evinced the slightest mental incoherence on any one point, nor any kind of hallucination. He appears, however, so utterly callous with regard to every moral principle and feeling, so thoroughly unconscious of ever having done anything wrong, so completely destitute of all sense of shame or remorse when reproved for his vices or crimes, and has proved himself so utterly incorrigible throughout life, that it is almost certain that any jury before whom he might be brought would satisfy their doubts by returning him insane." A very remarkable, and in some respects analogous, case is reported in the *American Journal of Insanity* (October, 1846). A girl, eighteen years of age, guilty of arson, is represented to have been quite destitute of the moral feelings. "She possessed quick perceptions, good reflective capacity, and a large share of ideality, etc.; but no human kindness had she, nothing human indeed, but her form." She is stated to have resembled a serpent in her movements. "Her skin was cold—circulation very slow; her skin was spotted like a common species of snake." Dr. Davey has expressed himself very decidedly in favor of the union of moral idiocy with intellectual ability, in an interesting paper in the *Association Med. Journal* (September 13th, 1856); and although we hesitate to admit what can properly be called moral idiocy apart from more or less lesion of the intellect, we fully grant that there may occasionally be good intellectual abilities in as-

sociation with congenitally feeble moral powers and volition (a moral *insensibility*), and therefore a proportionate irresponsibility.

We may mention the case of a patient admitted into an asylum at the age of seventeen, laboring under moral insanity and epilepsy. He possessed decided intellectual vigor, united with an exceedingly obtuse perception of moral responsibility. His father stated that his character had been the same "from the cradle." At nine years of age he endangered the life of a little boy, his play-fellow; subsequently at school he was characterized by similar mental qualities, learning more quickly than other boys, yet committing many acts of violence. He was, consequently, obliged to leave several schools. We know of another well-marked case of peculiarity in the temper and moral disposition, manifested from the earliest infancy, in which the intellectual faculties are not only equal to but above the average. The disease or defect was hereditary. The patient has been in an asylum for years. The same author speaks thus of the condition of mind (moral or affective insanity), when first exhibited in adult life: "Here the standard of mental health may justly be sought for in the natural and habitual character of the patient." This it is which is now altered, and the symptoms by which it is rendered manifest may next be considered. Usually the change in the feelings and conduct of the patient is gradual. Frequently, he is more absorbed and reserved, and on any provocation, however slight, is unreasonably irritated. He becomes suspicious, liable to attribute false motives to his friends and others, and to cast ungenerous reflections upon his nearest relatives. The husband suspects the fidelity of the wife, the wife that of the husband, without the slightest foundation. The patient is observed by strangers to be morose, and as the cloud gathers his acquaintances become conscious that he is somehow or other an altered man, without knowing why, and very probably without once supposing the man to have become insane.

At last the storm bursts, and some act is committed of an outrageous character. He is then regarded as either insane or criminal: the former, probably, if the act does not make him decidedly amenable to the laws of his country, and his destination is the asylum; the latter, most probably, if the act has been homicidal, and he is consigned to the executioner.

In other cases an individual has been subjected to overexertion of mind, his powers overtasked, or his feelings put upon the stretch in consequence of anxiety or unaccustomed responsibility. He then

finds himself susceptible to the slightest mental emotion, loses his sleep and rest, is conscious of more or less uneasiness about the head, a sense of tension and dull, aching pain, is probably troubled with palpitation of the heart, and finds himself unequal to the discharge of his usual duties. His digestive organs are also often disordered, his appetite uncertain, the secretions depraved. In addition to all this, he may be distressed by certain impulses and tendencies which are alike repugnant to his reason and to the dictates of his moral nature. Often the impulse "is to do violence to himself or others, or simply to break glass or articles of furniture." Pinel was the first to call these cases "reasoning madness," while Pritchard preferred the term "moral insanity." Ray tells us that "the *affective* as well as the *intellectual* faculties are subject to derangement."

There are cases where there is the presence of homicidal impulse and also cases of suicidal impulse, without other symptoms of insanity. I think a close examination would reveal an insane taint in the family history could it be brought to light.

Dr. Blandford, of England, says: "Under the names of moral insanity, emotional insanity, impulsive insanity, affective insanity, has been described the disorder of certain patients, which is manifested by insane actions and conduct rather than by insane ideas, delusions, or hallucinations. Such persons are sometimes said to be of whole and perfect intellect, though unsound in the moral and emotional part of their brain. They come under the notice of medical men not so much for purposes of treatment as for diagnosis. Their conduct being chiefly displayed in foolish or violent acts, they require to be restrained, and the question arises: Is this conduct badness or madness? Are they responsible for it or not?"

There is in all the cases of this form of insanity that the author has met with a total absence of delusion, and this may, perhaps, be said to be the great diagnostic mark of reasoning mania, or moral or affective insanity, whichever we may please to term it. There is in these cases an entire change of character and habits, evinced by extraordinary acts and conduct. There are false assertions and false views concerning the best friends and relatives. The approach of this form of insanity is not sudden, but rather gradual and imperceptible. The strange character of the acts is not at first so marked as it is afterwards. It generally takes some time before the patient's friends can convince themselves that such conduct is the result of disease, and many will look upon such an insane person's acts

as the signs of depravity. After a time the insanity becomes well-marked, and overt acts are committed which leave no difficulty in making a diagnosis. False and apparently wicked assertions concerning the nearest relatives, or plots to annoy, may constitute almost the only symptom, at times, of this form of insanity which the public can see or hear of, particularly if the nearest relatives carefully conceal from the world all outrageous conduct which is shown at home. Such patients deceive the public by their plausibility and their ready excuses for their conduct. Dr. Blandford very truly says: "When we can ascertain that the condition of things is something which has come over the patient, being formerly absent, and that a man is altogether changed, we may suspect insanity." These patients are very acute and cunning, and most unmitigated liars. There may sometimes be in the history of these cases a period, though short, of acute mania or acute melancholia. This may also be a precursor of a marked insanity with delusions and hallucinations. In this variety of insanity a man may squander all his property or he may become a dipsomaniac. This form sometimes constitutes one period of circular insanity, where periods of depression alternate with those of excitement, with exaggerated conduct and absurd acts.

The responsibility of the class who have been from birth odd and peculiar, and who seem incapable of acting and behaving like other people, is sometimes difficult to estimate. They have a congenital moral defect; they never tell the truth; they are, so to speak, moral imbeciles, and it is very hard to say just how far they are responsible. Guiteau was just such a case. They are generally the offspring of parents tainted with insanity.

C. H. Hughes, M.D., St. Louis, Missouri, says, respecting moral (affective) insanity:

Notable instances of the subversion of mind, without accompaniment of mental perversion, are found in those cases of gangliopathy which proceed to the extent of fainting, epilepsia, chorea, etc., in which either volition or both the will and consciousness are subverted. The ganglionic (visceral) origin of certain forms of hypochondria, melancholia, and hystero-mania has been admitted since the time of Hippocrates. Morbid states of the reproductive system have long been deemed sufficient sources of certain forms of mental derangement, in which the feelings rather than the reasoning processes are disordered.

It is conceded that kleptomania, pyromania, dipsomania, homicidal and suicidal impulses, and the morbid displays of pregnant women, and the mind disorders connected with the critical periods of woman's life, may have their starting-point in uterine disorder, even with more unanimity and certainty than puerperal mania, for the latter is often as much an insanity of general hæmic and neuric exhaustion—anæmia and shock—as of

reflex irritation. And, if reflex insanity be conceded, the possibility of moral insanity must be admitted, for the concession acknowledges the varying shades of mental involvement, depending upon the degree and source of the reflected irritation, from the insane longings and freaks of pregnancy to the infanticidal and other morbid impulses of *post-partum* cerebrasthenia. To concede the possibility of a homicidal or other morbid impulse not founded in delusion (and psychiatry furnishes abundant proofs of such impulses), is to admit the basis fact of moral insanity as it is clinically observable, namely, insanity not the *result* of reason perverted by disease.*

When ganglionic disease is great and the morbid consequences profound enough to involve the intellectual faculties in marked disorder, those who deny the possibility of insanity existing without appreciable lesion of the intellect, now willingly admit the existence of mental disease, and *unwittingly*, in those minor degrees of eccentric irritation connected with the period of utero-gestation and manifested in peevishness, and insatiable longings and changes of temper, they charitably concede that the patient is to be excused for not putting as complete a rein upon the display of eccentric feeling and action as would be considered the proper thing in one not *enceinte*. The intellect may appear intact or coexistent with a minor degree of moral or emotional perversion, and the perverted moral feeling excused or extenuated, if indulged; yet, if we pass a few steps further and venture to say that a seemingly resistless impulse, to which the will yields while the intellect disapproves, is insanity, then their theoretical conception of the unity of mind—it being impossible for them to understand how emotion, volition, and thought can be separate—leads to the rejection of one of the most demonstrable facts in practical psychiatry, as well as one of the most demonstrable facts in our every-day intercourse with minds that are not insane. Persons in the best of health are constantly acting from impulse, prejudice, or passion, conforming to society's usages and the dictates of fashion or feeling without sufficient thought.

The emotions and the intellect are not twin-born, though they mutually influence each other. They do not always go hand-in-hand or dwell harmoniously, though tenanted together in the brain. In good cerebral organizations they are often at war with each other. The things which even sane men ought not to do they often do, and those they ought to do they sometimes do not.

The Apostle Paul confesses this of himself. If a saint can concede this much of a healthy mind, a sinner can do no less for the victim of disease. Paul was a good psychologist, and discerned, though unconscious of their physiological foundation, the ganglionic source of certain encephalic states. He was "constantly at war with his members." When he "would do good, evil was present with him."

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* Tilt saw a case where pressure upon an inflamed ovary excited epileptic fits. I have seen a vaginal injection cause a maniacal paroxysm, some of the injected fluid having passed up into the uterine cavity. Sir Benjamin Brodie brought on a fit of chorea by gentle pressure over the stomach, and the effect of a smart blow in producing faintness is so well known to the prize-ring that it is considered foul to hit below the belt. Even death has resulted from violence done to the semilunar ganglia. But these effects are not more singular than the irritation of dentition, or worms, or undigested substances in the alimentary canal causing infantile convulsions; the effect of a fistula in causing melancholia with impulse to suicide—passing away after a successful operation; the many eccentric sources of epilepsia, tetanus, cerebral irritation, hyperæmia, etc.

Tait excises an ovary and cures an epilepsy; Charcot compresses one; and Kussmaul a testicle, causing reflex hystero-epilepsy; and the temporary subversion of mind from wound of testicle was well known before Charcot, Kussmaul, Tait, Brodie, or Tilt were known to fame.

I commend St. Paul as a psychologist to certain of our confrères. May the convincing light of truth shine upon them as it did upon the persecutor of the proto-martyr on his way to Damascus, and by way of contrition for the wrong they have done and may yet do that least commiserated of all the mentally afflicted,—the emotional, the impulsive, and the morally insane,—may they speedily make amends by renouncing their heresies and, embracing the true faith, become followers of the faithful Rush, Pinel, Prichard, Maudsley, Bucknill, Tuke, and Ray.

Stephen had been stoned, it is true, but there still remained others to be saved. Many an honest Saul in our ranks, consenting to this wrong, remains to be converted. If there be any who, in perfect health, has not yielded to the dominion of impulse, emotion, or passion, let him cast the first stone at the victim of mental disease, whose intellect, while it does not restrain, yet seems not touched by the morbid process which has deranged the affections, the emotions, and the will.

Insanity of the emotions, propensities, and passions, in which the intellect, if at all disordered, *is not appreciably so, or only momentarily so by being in abeyance or unable, through some want of connection of the will or controlling power of the latter over the impulses and passions, is a fact, however it may clash with theories of the so-called unity of mind.* It is a fact as much so as ecstasy or hypnotism, somnambulism or dreaming, which are not completely harmonious and united actions of all the mental powers. As much a fact as prejudiced, or biased, or unconscious cerebration in the healthy, working state of mind. As much a fact as the many varieties of aphasia without intellectual impairment, which the great Trousseau rejected, because he was biased in judgment by the dominant theory of Condillac and Warburton, that the mind could only think in speech. As much a fact as certain illusions or hallucinations in which the intellect does not concur, though during the formation stage of these mental spectra the reason may be in momentary abeyance. We should recognize the fact, though in so doing we may have to mend our theories or even abandon them. We should never whittle down facts to preconceived metaphysical notions.

All observation of the varying degrees of emotional, impulsive, and intellectual life in different persons and in the same person at different ages of life attest the possibility of disorder of the emotions, propensities, or passions, without more appreciable intellectual lesion than we see in persons who are regarded as right-minded.

Though insanity is marked generally by change of character, that change is seldom manifested in augmenting the power of the intellect and the will over the emotions or passions. On the contrary, the latter often subvert the former. Usually the disease, beginning with moral or emotional perversion, gradually involves or undermines the reason and judgment. It is thus that, in the early stages, moral, emotional, and impulsive disorder is mainly divorced from the intellect (if the two are ever then truly wedded), and what begins with an insanity of the feelings, propensities, or passions, usually goes on (if not arrested by timely medical interference) to the graver forms of more general mental involvement. These cases may even pass, if not cured, into the stages of delusion and dementia, a fact which has led some writers to doubt their existence unless associated with intellectual involvement, but which really proves the kinship of these contested varieties of mental derangement, even where neither delusion or other intellectual lesion appears, with universally recognized forms of insanity, just as the insane heredity of moral mania often establishes in our mind the fact of insanity as contradistinguished from uncomplicated vice when we are in doubt.

Men in their sanest states are often more influenced by their feelings, prejudices, and passions than by their judgments. Insanity generally expresses itself more in action than in speech. The restlessness and constant muscular activity of many lunatics is not always

the expression of disordered intellection so much as it is an accompaniment simply of morbid feeling or irritation of psycho-motor centres, and sometimes the acts of the insane, if their after confessions in seemingly lucid intervals may be taken as even approximately true, are not infrequently independent of both conscious thought and feeling. They appear often as blind freaks of disease or mental caprice, in which the highest intellectual centres seem only unconsciously involved.

That vigorous thinker, John Locke, who was not a mere surface observer, though he looked at insanity rather too superficially for a practical alienist, was led to the conclusion—not strictly true, but not altogether erroneous—that the insane did not so much "appear to have lost the faculty of reasoning, but, having joined together some ideas very wrongly, they mistake them for truths, and they err as men do who argue right from wrong principles, for by the violence of their imaginations—having taken their fancies for realities—they make right deductions from them. Thus you shall find a distracted man fancying himself a king, with a right inference requiring suitable attendance, respect, and obedience; others, who have thought themselves made of glass, have used the caution necessary to preserve such brittle bodies. Hence it comes to pass that a man who is very sober and of a right understanding in all other things may, in one particular, be as frantic as any in Bedlam if either by any sudden, very strong impression, or long fixing his fancy upon one sort of thoughts, incoherent ideas have been cemented so powerfully as to remain united." Locke here has reference to the deluded or delusional insane, and is only in part correct, for the insane do often both reason illogically and incoherently and establish wrong premises, from which their reasoning proceeds. Doubtless the correct reasoning manifested sometimes in the affective insanities contributed to the formation of his only partly correct opinion, for in the next sentence he says, "There are degrees of madness as there are of folly—the disorderly jumbling of ideas together is in some more, some less," and in some (he might have concluded, had he been as familiar with the insane as they should be who aspire to correct notions respecting them) there seems to be no appreciable lesion of the reasoning faculties.

Locke's idea of insanity was that it must always be intellectual aberration, and yet his observation taught him, despite his philosophical bias,—a bias in which many mental philosophers of the purely psychical school still share,—*that many lunatics reasoned well.* It never occurred to him to deny the existence of insanity in such, but to assume that they joined some ideas wrongly together.

With reference to another observation of Locke's, viz., "that reverence gives beauty and prejudice deformity to our opinions," it may assuredly be said with equal truth that intellectual processes in both the sane and the insane are incited to action and influenced by moral or other emotions, excited either by example of others or by disease.

Those who deny the existence of moral insanity insist that there always exists a certain degree of intellectual acquiescence that entitles it to be termed intellectual insanity, though that intellectual perversion may be and often is no greater than that which is found in the naturally immoral and depraved; but, if one concede this, there yet remain cases of moral and emotional disease where the intellect not only does not acquiesce in, but actually discountenances and seeks to be restrained from, the morbid impulse, or to subvert the morbid feeling.

Momentary impulses and suggestions of a morbid kind* obtrude themselves upon

* The great Mârè relates of himself how he withdrew from a bridge he was about to cross, lest he should yield to the impulse which came upon him to precipitate himself into the Seine. How many persons have confessed to feeling a disposition to precipitate themselves into the water when looking over a steep precipice, or the sides or stern of a steamer.

many healthy minds, like the vague feelings of unreasonable unrest and depression which obtrude unbidden into the neural chambers of the cerebral cortex.

Facts like these, and a hundred others needless to enumerate, show the capability of the mental faculties to become partially involved in aberrant action without notable derangement of the reason.

Men are not considered insane because they do not act wisely; why should it be insisted upon that the intellect should show disorder before insanity is recognized in those whose impulsions are undoubtedly of morbid source, and why should the intellectual implication, when it is found, though it be no greater than that of some men moved by passion, be insisted upon as the essential feature of the disease?

How, then, can we doubt the possibility of forms of emotional and impulsive insanity, in which the moral faculties are so involved by disease as to cause the individual to appear depraved? The converse, too, is true. There may be moral exaltation from disease as well as from intellectual conviction, even from sexual excitation (excessive or suppressed gratification) religious exaltation may result, as Dr. Workman and others have shown, and that, too, without ecstatic visions or special delusions. Dr. Benjamin Rush* noted long ago that a morbid state of the sexual appetite "becomes a disease both of the body and mind." This pioneer in American psychiatry and close observer of the insane, readily discerned that the will might be deranged even "in many instances of persons of sound understandings and some of uncommon talents, the will becoming the involuntary vehicle of vicious actions through the instrumentality of the passions,"† under which head he included what he termed the lying disease, which "differs from exculpative, fraudulent and malicious lying, in being influenced by none of the motives of any of them." "Persons thus diseased," he says, "cannot speak the truth upon any subject, nor tell the same story twice in the same way, nor describe anything as it has appeared to other people. Their falsehoods are seldom calculated to injure anybody but themselves, being, for the most part, of a hyperbolical or boasting nature."‡ He inferred it to be "a corporeal disease," from its sometimes appearing in mad people, who are remarkable for veracity in healthy states of their minds, several instances of which he saw in the Pennsylvania Hospital. He recognized certain stages of intemperance as a disease of the will, and was the first to propose a hospital for inebriates, or "sober house," as he termed it, comparing the weakened will of a drunkard to a paralyzed limb. Rush also believed in a derangement of the principle of faith, or the believing faculty, caused by disease, also in derangement of memory, under which head he includes some instances of aphasia, without the accompaniment of intellectual aberration. He was an unequivocal believer in derangement of the moral faculty, conscience, and the "sense of Deity," and notes especially the case of a boy of thirteen years, in Bethlehem Hospital, described by Haslam, "who was perfectly sensible of his depravity, and often asked why God had not made him like other men." In the course of his life, Dr. Rush was consulted in many of "those cases of total perversion of the moral faculties." "One of them was addicted to every kind of mischief. Her wickedness had no intervals while awake, except when she was kept busy in some study or difficult employment."

This great observer concluded that in these cases "there is probably an original defective organization in those parts of the body which are occupied by the moral faculties of the mind,"§ though he could not determine where to draw the line which divides free agency from necessity, and vice from disease. He discourses further as follows:

"In whatever manner this question may be settled, it will readily be admitted that

* New Obs. and Enquiries, 1812, p. 347.
† Op. cit., p. 264.
‡ Op. cit., p. 265.
§ Op. cit., p. 360.

such persons are, in a pre-eminent degree, objects of compassion, and that it is the business of medicine to aid both religion and law in preventing and curing their moral alienation of mind."*

Thus did one of the fathers of American medicine contribute in the beginning of the present century to the overthrow of that opprobrious doctrine of diabolical possession, or moral depravity, which has led many a hapless lunatic to the stake or the gallows, and to give us in its stead the conception of moral mania, a form of insanity just as real as the demonomania which overtook unfortunate old women past the menstrual climacteric in Cotton Mather's day, and resulted in their being drowned for witchcraft, and which, notwithstanding the reality of disease for its cause, finds even now in some quarters neither commiseration nor extenuation, being regarded as the manifestation of a wicked and devilish spirit, entitling its possessor to the punishment of the gallows or the penitentiary, rather than the restraint and treatment of the asylum for the insane. The existence of the knowledge of right and wrong with the judge, the absence of appreciable intellectual disorder with the physician, are regarded as incompatible with their ideal conception, *not of what insanity is*, but of what it to them *ought to be*, and the penalty for this theoretical misconception of the real nature of mind is visited on the unfortunate victim of disease, whose bad luck it is to be afflicted in a manner theoretically proscribed. Theoretical views and metaphysical conceptions of mind have too long stood in the way of true progress in psychological knowledge. To this has been due the fact that physical disease, as the basis of all forms of mania, now a generally accepted truth, was so long controverted. To this stumbling-block are we indebted for the inhuman treatment the insane received in the time of Galen, and up to that comparatively recent period when Pinel immortalized himself and lifted humanity to a higher pedestal by striking the shackles from the madmen in the dungeons of Bicêtre.

There is a somatic as well as a psychic element in mind as we are permitted to see it, to be taken account of in all study of psychical display, whether in health or disease, though what mind is we do not know, and perhaps we may never completely comprehend, save in its manifestations. All that we can see of mind is displayed in the operations of the intellect, the emotions, feelings, and the will. There is a time in life when we see but little of the former, and a time when we see more of it than of the two latter attributes of the accompaniments of mind. The emotions and the will are part of the mind, as it manifests itself to us; and whatever may be our preconception of the impossibility of their being separated, if we see them practically severed by disease, it is only just to acknowledge the fact.

To assert that the doctrine of moral insanity is a dangerous one, from which society may suffer, as Mayo and his followers have done, is to render science subservient to social polity, illogical, cowardly, and, of course, unscientific, whereas social polity should be ever subservient to scientific truth, whatever that may be revealed to be. Let us, always speak according to our convictions. If we trim and prune truth so that we may adopt it to social expediency, we become false lights; we degrade science, the sceptre of influence falls from us, and judicial wrongs, even murder perpetrated by strong-handed Law upon the weak and miserable, will continue to be committed in our name, and be the lasting monument of our disgraceful surrender of truth.

There *is* moral perversion and degeneration resulting from disease, with but little, if any, appreciable intellectual lesion, less intellectual lesion oftentimes than we find in those whose lives have been given up to vice, through self-will, or parental coercion, or evil communication. Then let us, when occasion demands, tell the courts so, and not

* Op. cit., p. 300.

say we cannot conceive it possible for moral derangement to exist without concomitant intellectual aberration, while observable facts confute such theories, and let us turn our attention to searching out, for the aid of jurists, instead of ignoring the line of demarcation between responsible and irresponsible vice; the characteristics of disease on the one hand, and on the other, voluntary moral depravity coupled with a body sound and a mind free to choose.

Moral insanity constitutes an observed and observable fact of psychology; let us not seek to theorize it out of existence.

The metaphysical conception of mind, the abstraction made into an entity, as Maudsley justly observes, "has overridden discerning observation" in some quarters, and eminent and observing men have thus suffered their judgments to become biased by the idea that the faculties of the mind cannot act separately; that to derange one must necessarily and appreciably disorder others.

On this reasoning, many eminent men believe the existence of moral insanity impossible, while others, among them the lamented Ray, not so biased, following in the footsteps of Prichard, who first promulgated the doctrine, see no more difficulty in recognizing insanity of the moral feelings, and of other impulses, propensities and passions, without necessary involvement of the higher faculties of reasoning in appreciable disorder, than the great Pinel did long before them in discerning what, up to his time, was regarded as equally inexplicable, namely, mania without the delirium of madness.

Dr. Mayo,* who made the first and strongest assault on the doctrine of Prichard, has unwittingly admitted, as indeed all close observers of insanity know, "that the earliest indications of approaching insanity are moral," and he makes the further fatal admission, "that at every period of the actual presence" of insanity "the powers of self-control are interfered with, the affections suppressed or altered, the passions excited or perverted."

All practical observers concede a frequent gradual change of feeling and conduct in prodromal insanity preceding the culmination of intellectual aberration, and some who deny the possibility of moral insanity make a classification of *moral imbecility*, concessions which logically debar all opposition to moral insanity.

Whatever the stage at which we view mental disease, whether initial or terminal, insanity exists, as much so, as fever at any stage of typhoid or typhus is fever. If a change of moral conduct have disease for its cause, it is as much entitled to be called insanity as the morbid aversions, antipathies, fears, or acts, not brought about by delusion, are to be classed among the recognized evidences of mental derangement.

Blandford's searching analysis of Prichard's cases, while it divests many of them of the vestments of uncomplicated moral insanity, leaves a number that cannot be elsewhere placed, "good examples of what may be called moral insanity, if the term is to be used at all," as Blandford himself confesses, one of which he concedes deserves to be called morally insane.†

Those who engage in the study of morbid mental phenomena with the preconception that the intellect must be always synchronously deranged in all morbid mental expression, must consistently regard every act or feeling of the insane person "as plainly the outcome of some idea present for the moment, but present, possibly, but for the moment, and then so obliterated that the individual has lost all trace of it,"‡ in certain morbid impulsions or feelings. Those who think "the intellectual and emotional functions of the mind cannot be divorced, that the ideational portion of the mind is so intimately joined

* Elements of the Pathology of the Human Mind, Medical Testimony and Evidence in Cases of Lunacy. By Thomas Mayo, M.D., F.R.S., London, p. 64.

† Cases 4 and 5, p. 317. Insanity and its Treatment, 1871. ‡ Ibid., p. 319.

in operation to the emotional—the stored ideas of the brain are so influenced by the feelings of the moment, whether these arise from within or without—that the two must be sound or unsound together," will be reluctant to concede the demonstrable fact that the affective life may be greatly changed by disease, while the intellectual processes remain intact, so far as may be discernible by any known methods of testing the integrity of the reasoning powers; slow to recognize those cases in which the will and not the reason is weakened and perverted. Yet the morbid impulsions arising in neuropathic organisms, often reasoned against and sometimes resisted, but finally surrendered to, stand out in practical refutation of the impossible conception of the invariable unity of mind disturbed by disease.

The dipsomaniacs, the kleptomaniacs, and sometimes even pyromaniacs, yielding to impulses against their reason, are examples no less destructive to this hypothesis than the auto-amnestic acts and impulses of hypnotism, somnambulism, and certain epileptoid states. To gauge insanity by the integrity or non-integrity of the reasoning processes alone would make the automatism of certain manifestations of alcoholism, epilepsia and mesmerism normal mental states. The reasoning faculties in moral insanity often appear to act as correctly as in the most perfect cerebral automatism. If there is lesion short of intellectual disease and beyond that of pure derangement of the moral faculties, and there usually is in this as there is in all insanity, a degree of auto-amnesia by which the affected individual does not discern the change that has taken place in himself, it is simply an impaired or lost appreciation of the transformation in his character, which has been brought about by disease, but many sane persons also fail to discern their descent into vicious ways. However, if this degree of involvement of the comparing faculties be deemed sufficient to ally it to insanity in general (and it does on the basis of a part of Conolly's definition), and thus to rescue a real mental disease from the theoretical assaults made upon it, we cheerfully concede it, for it is a fact that the morally insane, like most other insane persons, usually do not see themselves as others see them. But there are cases where the search must be exceedingly close to reveal any greater lesion.

Normal mind is the sum of the aggregate display of the cerebro-psychic functions constituting the natural "ego," abnormal mind consists of such disorder of one or more of the cerebro-psychic functions as causes so marked a change in the psychical characteristics of the individual, whether principally involving the emotions, the reasoning powers, or the will, as to make an inconsistency and inharmony in the person's character explicable only by disease.

Moral insanity is as clearly comprehended in this definition as other forms of mental derangement, and as much entitled to be recognized as a distinctive appellation and form of disease as the many other mental affections that are named on account of their prominent symptomatic feature or features.

Not to recognize it in the present state of cerebro-mental pathology would in certain instances prove disastrous to the rights of the insane before the courts, and to their welfare elsewhere.

CHAPTER VIII.

MENTAL RESPONSIBILITY AND THE DIAGNOSIS OF INSANITY IN CRIMINAL CASES.

At the present day medico-legal cases are becoming very frequent in which it is necessary to ascertain as to the insanity of a person accused of a criminal act in its relation to his civil capacity and responsibility for criminal actions, and also as to feigned or concealed insanity. It becomes, therefore, a very interesting question what test of insanity the law should recognize as a valid defence in criminal cases. This question—although one which it seems difficult to settle satisfactorily, and which judges, lawyers, and medical experts are constantly disputing about—assumes, every day, greater interest and wider significance owing to the increase of insanity in our country disproportionate to the increase of population which has taken place during the past twenty years, and which will continue to take place. Without inserting dry statistics, it is sufficient to say that a comparison of the increase of population from 1850 to 1870 with the increase of the number of the insane during the same period reveals an increase of insanity over that of population of about twelve per cent.

The increase of insanity among our own population is due largely to a change from a vigorous, well-balanced organization to an undue predominance of the nervous temperament which is gradually taking place in successive generations. The educational pressure on the young to the neglect of physical exercise, the increasing artificial and unnatural habits of living, the great excitement and competition in business, are all tending to induce and multiply nervous diseases, many of which must terminate in insanity. These causes and the evils resulting from them are propagated by the laws of inheritance in an aggravated and intensified form. Insanity is also appearing gradually at an earlier age than formerly.

This is due largely to the great mental activity and strain upon the nervous system that appertain to the present age and state of civilization, and which tend to a rapid decay of the nervous system. With many persons it is but a step from extreme nervous susceptibility to downright hysteria, and from that to overt insanity. The question of mental responsibility in its relation to criminal cases is

one of great interest, and presents a wide field for study and investigation. The facts of criminal psychology have led the writer to regard the impulse of criminal natures in the light of natural laws, and there is, beyond all doubt, an anthropological change which lies at the foundation of criminal propensities.* There is a deficient cerebral organization which lies at the foundation of these criminal natures, which occasions the disposition to an abnormal moral constitution. The dislike of work and the love of enjoyment are impulses which, when combined, lead especially to crime, when that ethic constitution or development is wanting which is necessary to the foundation of a powerful feeling of what is right. A further fundamental element, which stands in psycho-physical contrast to dislike of work, is an excessive physical consciousness of strength, which leads to arrogance and thereby to the pleasure of misusing strength against the weak. This impulse leads to the love of bullying, cruelty, and murder, if the higher intellect is absent which should turn the feeling of strength in a right direction, and there is also absent a complete ethical consciousness which should prevent misuse of power. This ethical weakness may be congenital, as has been remarked, or it may arise from deficient education.

In the domain of vices we meet with a peculiar condition of the central nervous system, which results in a temporary criminal impulse returning with a certain regularity. Such criminals are temporarily seized with the deepest remorse and are fortified with the best resolutions. They behave for a time in the most exemplary manner, until they relapse again, which relapse is unanimously attributed by them to an irresistible impulse. This state of *moral epilepsy* is of great significance in the psychology of crime, as a physiologist is led to institute a comparison between such cases and several states of disease in which a peculiar type is observable, consisting in the fact that attacks of illness of more or less duration alternate with more or less long and, generally, for a time, preponderant, healthy intermissions. In a broad sense, one may designate all these pathological states as *epileptiform*, hence the term "moral epilepsy," which has been adopted above. Leaving this interesting question of the psychology of crime, we would ask if the true basis for jurists to proceed upon is not *the protection* of the existence of normal persons against the *ethically degenerate?* And the necessary degree of this

* Benedikt has shown this conclusively, and the reader is referred to the last chapter of this work for the full consideration of this most interesting question.

protection is, most certainly, an essential measure for the severity of the punishment. The first trial of note where there was the question of insanity advanced was in 1723, when the trial of Arnold for shooting at Lord Onslow occurred. Although it was shown that Arnold had been of weak understanding from his birth and that he was doubtless insane, the jury brought in a verdict of guilty, and Arnold would have been executed had it not been for the intercession of Lord Onslow.

The language of the charge to the jury in this case was in conformity to the rule laid down by Lord Hale, that partial insanity does not excuse a person from the consequence of his act, and that a total deprivation of reason can furnish such an excuse. In the year 1800 the celebrated trial of Hatfield for shooting at the King, in Drury Lane theatre, excited much interest. Although it was proved that in 1793 Hatfield, who was a dragoon, had received a number of severe wounds which had caused partial insanity, so that he was dismissed from the service, and since that time he had had periodic attacks of insanity, and had been confined as a lunatic, the prosecuting attorney laid down the established rule that a total absence of memory and understanding could alone shield the prisoner from punishment, and appealed to the jury for a conviction on that ground. It was only through the brilliancy of the advocate (afterward Lord Erskine) that the prisoner was acquitted. This trial had a good effect upon the judiciary, as in the year 1812, in the trial of Bellingham for the murder of Spencer Percival, Lord Mansfield laid down the law that the capability of distinguishing between right and wrong was the test for determining the prisoner's responsibility, thus discarding the old theory of an entire absence of all mental power and substituting this in its place. Afterward the theory of a general knowledge between right and wrong was modified, and the element introduced that the prisoner must know the difference between right and wrong at the time of and with regard to the particular act for which he is on trial in order to render him responsible, and this test has been preserved to the present time. In the early history of our own country the same barbarism in the treatment of the insane prevailed which darkens the pages of English history. In Governor Winthrop's *History of New England* the case of Dorothy Dalbye is mentioned. She was executed for killing her child. She was, beyond all doubt, an insane woman, but this fact was not recognized by Governor Winthrop, who says of her: "She was so possessed with Satan that he

persuaded her by his delusions, which she listened to as revelations from God, to break the neck of her own child, that she might free it from future misery." Such was the ignorance and prejudice of the early history of our country.

We are at the present day very far from a correct understanding of the workings of the insane mind, for in the recent trial of Scannall, the law was laid down as enunciated by the Court of Appeals in 1865, in the case of Willis *v.* The People, which held that a person was not insane who knew right from wrong, and that the act he was committing was a violation and wrong in itself. This theory of right and wrong is utterly inadequate to meet a large class of cases. There are certain cases familiar to all specialists in insanity, which suffer from impulsive insanity with a homicidal or suicidal monomania. These patients, without appreciable disorder of the intellect, are impelled by a terrible *vis a tergo*, a morbid, uncontrollable impulse to desperate acts of suicide or homicide. These patients are often fully aware of their morbid state, appreciate perfectly the nature of the act toward which they are impelled, and feel deeply the horror of their situation, and yet if not prevented by restraint will inevitably commit acts of suicide or homicide.

A very remarkable case was under the care of the writer, of a man who would at stated times acknowledge that he felt an irresistible impulse to kill some one, and would voluntarily enter an asylum and remain there until this morbid impulse had passed away, which was generally a period of one or two months. He has often told the writer that his life was made miserable by the idea that at some time this overwhelming impulse would come upon him so suddenly that he should commit some desperate homicidal act, but is not prepared to voluntarily incarcerate himself in an asylum for life, as his lucid intervals sometimes lasted for months at a time. The law, as laid down at present, would not decide this man to be insane, as he fully appreciates the difference between right and wrong, and the nature and consequences of any homicidal act that he may in the future commit. Such cases, which are not at all uncommon, serve to show what fearful injustice may be done under the name of justice, when the conclusion is based upon a metaphysical test which is proved by medical observation to be false in its application to the unsound mind. There is still another form of insanity denominated "moral insanity," in which the intellectual faculties are intact, no delusions or hallucinations existing, but where the normal sense seems

utterly obliterated. Such persons have no true moral feeling. This is disorder of the mind produced by disease of the brain, and it is an unquestionable form of insanity, as it often precedes other forms of insanity, in which intellectual derangement is well marked, as acute mania or general paralysis. In some of these cases there is a modified responsibility, the degree of such responsibility being determined by the particular circumstances of each individual case. One difficult but important question to be solved, is the civil and criminal responsibility of women who plead insanity before courts of justice, and who are often afflicted with kleptomania, pyromania, or who are infanticides, as a result of sexual trouble and disease of the pelvic organs. Such women under all reasonable conditions are entitled to the benefit of the doubt, because of their defective mental integrity, caused perhaps by pregnancy or by the subsequent emotional excitement attending parturition, which intensifies the cerebral disorder in a brain already morbidly active.

With women, extreme nervous susceptibility readily lapses into insanity. "In the sexual evolution, in the parturient period, in lactation, strange thoughts, extraordinary feelings, unreasonable appetites, criminal and suicidal impulses may haunt a mind at other times innocent and pure. It is probable also that young unmarried women, guilty of killing their own new-born offspring, are so distracted by conflicting feelings, sharpened to morbid acuteness by the great physiological movement of parturition, as to be hardly responsible for their acts." We come now to the question of the *diagnosis of insanity*.

In making an examination of a person accused of crime, and in whom insanity is suspected, the person should be visited by the medical examiner, who should draw him into a pleasant conversation, and inquire as to previous attacks of insanity, hereditary history, then into any predisposing causes of insanity, such as intemperance, vocation, habits, etc., which may have operated in the production of insanity. Also as to injuries of the head or spine which may have occurred, sunstroke, etc. The nervous system should then be examined for the existence of any such diseases as paralysis, epilepsy, catalepsy, or hysteria. The different senses, beginning with sight, should be examined, and in this way it may be discovered if there are hallucinations or illusions pertaining to any of the senses. A great many cases are on the border line which separates sanity from insanity, and it often requires the nicest dis-

crimination to determine whether such a patient has passed this border line. The writer would suggest a series of eight questions, which, if adopted by jurists in criminal cases, would prove a most efficient and just test as to the existence of insanity in any given case, viz.:

1. Have the prisoner's volitions, impulses or acts been determined or influenced at all by insanity, and are his mental functions, thought, feeling and action, so deranged, either together or separately, as to incapacitate him for the relations of life?

2. Does the prisoner come of a stock whose nervous constitution has been vitiated by some defect or ailment, calculated to impair its efficiency or derange its operations?

3. Has the prisoner been noticed to display mental infirmities or peculiarities, which were due either to hereditary transmission or present mental derangement?

4. Has the prisoner the ability to control mental action, or has he not sufficient mental power to control the sudden impulses of his disordered mind, and does he act under the blind influence of evil impulses, which he can neither regulate nor control?

5. Has the act been influenced *at all* by hereditary taint which has become intensified, so that the morbid element has become quickened into overpowering activity, and so that the moral senses have been overborne by the superior force derived from disease?

6. Was the act effected by or the product of insane delusion?

7. Was the act performed without adequate incentive or motive?

8. Does the prisoner manifest excitement or depression, moody, difficult temper, extraordinary proneness to jealousy and suspicion, a habit of unseasonably disregarding ordinary ways, customs and observances, and habitual extravagance of thought and feeling, and inability to appreciate nice moral distinctions; and, finally, does he give way to gusts of passion and reckless indulgence of appetite?

Some or all of these are found generally in connection with transmitted mental infirmity. It may be argued that these mental defects signify not mental unsoundness but human imperfection. Certainly if we take these manifestations, any one of them singly and alone, we cannot claim such a one as invariably an indication of insanity, but on the other hand, under certain circumstances, each one of them may be an unmistakable sign of insanity, or rather of a morbid cerebral state which may readily lapse into insanity. The disappointments and calamities of life obviously act with greater effect upon an unstable mental organization, these causes of disturbances

meeting with a powerful co-operating cause in the constitutional predisposition. Sometimes a crime even when there have been no previous symptoms to indicate disease, marks the period when an insane tendency has passed into actual insanity, when a weak organ has given way under the strain put upon it. There is a class of persons with a peculiar nervous temperament who inhabit the borderland between crime and insanity, one portion of which exhibit some insanity, but more of vice, and the other portion of which exhibit some vice, but a preponderance of insanity; and it is very difficult to form a just estimate of the moral responsibility of such persons, especially when we reflect upon the fact that moral feeling is a function of oganization, and is as essentially dependent upon the integrity of that part of the nervous system which ministers to its manifestations, as is any other display of mental function.

The writer has met with cases in which, as a result of parental insanity, there has been a seemingly complete absence of moral sense and feeling in the offspring, and this has been a true congenital deprivation, or a moral imbecility so to speak; of course such children can hardly fail to become criminals. In this connection, it is interesting to note that moral degeneracy often follows as a sequence upon disease or injury to the brain. A severe attack of insanity sometimes produces the same effect, the intellectual faculties remaining as acute as ever, while the moral sense becomes obliterated.

When such persons are acquitted, on trial, of a criminal act on the ground of insanity, they should be remanded to medical custody, and should never be set at liberty until the medical superintendent of the asylum deems them fully recovered; but the commonest justice plainly indicates that such custodial restraint be of a medical and not of a penal nature. It is a very difficult thing for the laity to recognize how sane a person may be who, all the while, has a greater derangement than was ever suspected until something happens to elicit the evidence of it, such as an attack of illness or severe mental strain, and some unconquerable impulse seizes him, and some homicidal or suicidal act results, to the great surprise of every one.

In the same manner inebriety often appears in maturity as a result of ill-health, mental shock, etc., and it becomes an interesting question as to the degree of moral and criminal responsibility which attaches to inebriates, as inebriety often depends upon an abnormal organic development of the nervous system that has descended from generation to generation, gaining in intensity until it manifests itself

in active inebriety, and there must certainly be a modified responsibility when homicidal or suicidal acts are committed during periods of such abnormal cerebration. In such cases a criminal act may be committed in consequence of cerebro-mental disease, without any apparent lesion of the perceptive and reasoning powers. In these cases, also, the mental disorder is of a sudden and transitory character, not preceded by any symptoms calculated to excite suspicion of insanity. It is a transitory mania or sudden paroxysm, without antecedent manifestation, the duration of the morbid state being short and the cessation sudden. In these cases the criminal acts are generally monstrous, unpremeditated, motiveless, and entirely out of keeping with the previous character and habit of thought of the individual. Such attacks are transient in proportion to their violence, and transition occurs on the completion of the act of violence. There is an instantaneous abeyance of judgment and reason, during which period the person is actuated by mad and ungovernable impulses.

Closely allied to this state of which I have been speaking is that peculiar psychological state—the trance state—which also occurs in inebriety. There has been very little medical study of these cases, although they are of great medico-legal importance. Crimes committed in this state are purposeless, and there exists *no* recollection of them in the mind of the sufferer. By "trance state," I mean a state where there exists loss of memory and consciousness for a time, varying from minutes to days, the patient giving no evidence by his acts of his real condition, and very likely attending to all of the duties of his business in a quiet, mechanical way. The mind may, however, in this trance condition, act in *unaccustomed* lines of thought and action, and, in certain cases, the *criminal* impulse may dominate the mind. As a rule, in these trances, it is probable that the mind acts, as before, with the same discretion, although the person himself can give no account of what has happened during this mental blank, during which the mind acts automatically. During this state a person may get into a dangerous mental condition, in which impulses of every description may take possession of and control his actions. It is a condition of irresponsibility. In these cases there is generally a neurotic constitution inherited from the ancestors, and a careful examination, which should never be neglected, will generally reveal either intemperance, insanity, or phthisis in the ancestors. The great diagnostic point which I would insist upon is that there is absolutely *no recollection* of what happens in this trance

state, and this want of memory cannot be successfully feigned so as to deceive a careful expert in inebriety and insanity. When a person, either a secret or an open inebriate, commits an unusual or criminal act (not during intoxication), and retains no recollection of the event, he should be most carefully examined for the existence of the trance state, which, if it can be proven, markedly lessens the responsibility of his crime.

The impulse to crime in these cases may develop in different ways. There may be suicidal or homicidal impulses, or buildings may be burned, or sexual assaults may be made, or be apparently very malicious. In all these cases medical care is plainly indicated. Persons unacquainted with this state may reason that because these crimes are committed in a way and manner perfectly cool and free from excitement, that they are evidences of a sane mind, but they are greatly mistaken, as it is the rule, and not the exception, to find these deeds performed in a cool, quiet manner, with no excitement. The deeds, however, are, to the person affected, *an unusual course of action*, utterly at variance with the previous character and habits. It is not right for inebriates who commit sudden, purposeless crimes to receive the full measure of punishment at the hands of court or jury without a proper study of their case by one who has studied these cases intelligently. Proper medical study would enable courts and juries to understand the mental conditions which causes these motiveless and purposeless crimes in inebriates. His act is not a vice, and you can neither assume his perfect sanity nor a capacity to reason clearly. The person in this trance state is not cognizant of his acts, neither, as I have said, does he retain *any* recollection of them afterward. There is absolute irresponsibility, and it should be made clear to both court and jury. The idea in these cases should not be to try to work on the sympathies of the jury, but to show them the existence of this trance state and the irresponsibility arising from it. In these cases we must prove that inebriety, as a disease, exists, and that it has affected intellect, manner, temper, disposition, habits, and character, and then that the trance state has supervened.

We will consider, finally, the medico-legal importance of epileptiform attacks, which may be partial in character, and which may not reach convulsive activity except so far as the mind is concerned. These attacks always display periodicity, and after the paroxysm there is an intermediate stage, during which, in most cases, the person remains in a confused state, perhaps for some hours, and is apt

subsequently to retain only a vague and general notion of the preceding events. Thus in a homicide by shooting, the murderer would be likely to be roused by the sound of the pistol-shot and to remember it, although he would not very likely remember the altercation at all, or what passed between himself and his victim. A case occurred recently, of considerable interest from a medico-legal point of view, in which a murder was committed during an epileptiform seizure which was the result of a previous sunstroke, the immediate exciting cause being an attack of illness and the taking of a small quantity of alcoholic stimulus, which, it is well known, acts as a poison upon persons who have been sunstruck. This state of what, perhaps, I may not improperly call moral epilepsy, in which the man was of whom I shall presently speak, is a morbid affection of the mind centres which destroys the healthy co-ordination of ideas and occasions a spasmodic or convulsive mental action. The will cannot always restrain, however much it may strive to do so, a morbid idea which has reached a convulsive activity, although there may be all the while a clear consciousness of its morbid nature. The case just referred to had complained of pains in the head and sleeplessness, which had displayed marked periodicity and which had been accompanied with great irritability of temper, excited by trifles and seemingly unconnected with personal antipathies. As has been previously stated, the person alluded to had been suffering from quite a severe illness, and, after taking a small quantity of alcoholic stimulus, went out to walk. He met a friend with whom he had been familiar for years, and a discussion arose as to the respective merits of certain politicians, when, the discussion becoming excited, the man pulled out a revolver and shot his friend. He then went, in a confused and dazed state, and sat for some hours on a dock near a river, and subsequently went home, and burst into tears, and informed his wife of the sad occurrence, and gave himself up at the police-station. There was no simulation of insanity by pretending to be incoherent or by strange actions, and no attempt, either on the part of himself or wife, to pretend that the act was an insane one. There was, however, a total blank in the prisoner's mind respecting the events preceding the pistol-shot, which seemed to have aroused his attention at the time, and he had no recollection of the fact that he had sat on the dock for some time afterward, as he was seen to do.

I was consulted by Judge ——, who appeared for the defence, and, upon ascertaining the prisoner's previous history, gave it as my

opinion that there had existed, for months previous to the occurrence, a profound moral or affective derangement, which, from its marked periodicity, was evidently epileptiform in character, and that the sudden homicidal outburst supplied the interpretation of the previously obscure attacks of recurrent derangement. There had evidently been induced by the sunstroke in this case an epileptiform neurosis, which had been manifesting itself for months, chiefly by irritability, suspicion, moroseness, and perversion of character, with periodic exacerbations of excitement, all foreign to the man previous to the attack of sunstroke. It is well known among specialists in insanity that this epileptiform neurosis often exists for a long time in an undeveloped or masked form, and that this neurosis is, moreover, connected with both homicidal and suicidal mania. Such attacks are often noticed to occur periodically for some time before the access of genuine epilepsy. I have often witnessed, in cases under my care, abortive or incomplete epileptiform attacks, where there were no convulsions and where there was no complete loss of consciousness. I have noticed in such cases, either a momentary terror, slight incoherence, a gust of passion, or a mental blank, the patient perhaps stopping in the middle of a sentence. The patient would then be himself again, quite unconscious of what had happened to him. Accompanying this confusion of ideas may be, as I have remarked, instantaneous impulses, either of a suicidal or homicidal nature.

Owing to the writings of Hughlings Jackson, Maudsley, Russell Reynolds, Hammond, Trousseau, Falret, Esquirol and others, epileptic vertigo is a recognized disease. There is abundant testimony to show that during such seizures persons may perform actions, and even speak and answer questions automatically. There are numerous examples in the works of the above authors, proving that in an unconscious condition persons can progress from odd or eccentric actions to deeds of violence, suicide or murder—being unable to remember the circumstances afterwards and, therefore, irresponsible for their actions. This class of patients I have always found irritable, easily excited, very emotional without adequate external cause, easily losing their train of thought, and often unable to collect or fix their thoughts. Such cases have told me that they felt impelled to strange and violent acts by some power which they could neither understand nor resist. Such patients may entertain delusions of fear and persecution, and commit criminal deeds as a result of such delusions. When such cases, in their terror or distress of mind, commit some

violent deed, they either experience immediate relief, as was the case with one patient under my care, who was only relieved by breaking out a pane of glass, when his paroxysm would subside, or they continued in a state of excitement, unconscious, or very imperfectly conscious of the gravity of their acts. When they become conscious again their memory is apt to be very uncertain as to preceding events.* Griesinger says: "Individuals hitherto perfectly sane and in the full possession of their intellects are suddenly and without any assignable cause seized with the most anxious and painful emotions, and with a homicidal impulse as inexplicable to themselves as to others." Maudsley says: "Let it be borne in mind then, that there are latent tendencies to insanity which may not discover the least overt evidence of their existence, except under the strain of a great

* The reader must distinguish between such cases as the above and cases of true *homicidal mania*, which latter, as Bucknill and Tuke have shown, may be classified under two heads: 1. Those cases in which there is no marked disorder of the intellect, examples of emotional insanity. 2. Those in which such disorder is more or less apparent. The former class may be subdivided according as there is or is not evidence of premeditation and design. In the latter class we include cases marked by deficiency of intellect, as idiocy, imbecility, and a degree of mental feebleness not amounting to either of these states, while other cases in the second class are rather indicated by a state of exaltation, shown by delusions or hallucinations which may constitute the motive. When any person says that they had not the slightest motive for a homicidal act *I always suspect masked epilepsy* even if there is no proof of it, although there is, of course, a morbid, overpowering impulse to take life, without intellectual disorder, and with intact perception and reasoning powers. There has been *petit mal* in nearly every case of transitory mania that we have knowledge of. Griesinger has truly said that we may have a morbid mental state which may present no external manifestation. Legrand du Saulle's case of a young man, "Theodore," of twenty-six years, who assassinated two men without premeditation, without motive, and without apparent excuse, was undoubtedly a case of epilepsy complicated with transitory mania. Castelman, Devergie, Calmeil, Tardieu, Marcé, have all reported cases of this nature. A young man of education placed himself voluntarily under our professional care acknowledging impulses to commit homicide, and said that he did not like to have razors or knives around him for fear that he should be unable to resist these impulses. "I never feel sure of myself," he told me. He evidently felt himself to be irresponsible, and expressed himself forcibly to me on this point. I urged him to voluntarily place himself in a well-regulated asylum for the insane, but neither himself or his family would acquiesce in this measure of preventive medicine, and he is still at large. He said he had received a blow on the head and had also suffered from heat prostration to the extent of insensibility, and complained of cephalalgia. I have had an opportunity of studying another case of what I think is pure moral insanity, where there is an utter moral insensibility, and where the whole channel of thought runs in the direction of how to successfully commit homicide. There are sexual perversions in this case. There is marked sleeplessness, but the perceptive and reasoning powers are very good. There is premeditation and cunning design, and a knowledge of right and wrong. This patient has also suicidal impulses.

calamity, or of some bodily disorder, and that the outbreak of actual disease may then be the first positive symptom of unsoundness." The question as to the degree of mental responsibility attaching to such cases is one of great interest to psychologists and also to jurists, and one to which it is hoped, in the future, much more attention may be directed than has been given to it in the past.

CHAPTER IX.

THE HISTOLOGY AND FUNCTIONS OF THE CEREBRUM.

THE study of the histology and functions of the cerebrum—not alone of the several ganglionic centres, but also of the different layers of the great "hemispherical ganglia" formed by the convolutions of the cerebrum—has as yet been little prosecuted. It presents a wide field for investigation, experimental inquiry and discovery; and already such investigators as Dr. Ferrier, Sir Charles Bell, Dr. Carpenter, Dr. Brown-Sequard, Charcot, Pitres, Maragliano, and Tamburini have thrown great light upon the localization of brain functions.

We may now regard it as established that the ascending parietal convolution of the brain is connected in its innermost and superior part with the motility of both the upper and lower limbs; in its middle part with the motility of the fore-arm and head, and in its external or inferior part with the facial muscles. Also, that the ascending frontal convolution in its most external or inferior part, where the third frontal has its origin, is the motor centre for the muscles of the lips and the tongue, a function which is also shared in by the foot of the third frontal convolution. In these last-named cortical centres, the transformation of ideas and verbal images into motor impulse towards the muscles destined for the pronunciation of words takes place. Paralysis, atrophy, and convulsive movements will prevail in any given case as a rule, in the limb or limbs whose cortical centre is most profoundly affected by destructive disease, while in epilepsy, from the region of the body where the convulsive movements commence, which open the epileptic access, we may with security diagnosticate the cortical centre primitively and principally affected,

which is that corresponding to the group of muscles earliest brought into action.

The functions of the cerebellum are supposed to be related to co-ordination, as in cerebellar affections we have a sort of reeling gait, with severe vertigo, and perhaps also severe and continuous vomiting, while psychic disorders are lacking, except in general atrophy of the cerebellum. These symptoms, however, cannot be considered as pathognomonic always, as they are also present in other central nervous affections.

Respecting the pons varolii, we may diagnose with certainty recent hæmorrhages into this part where its especial cross paralysis is present, and we may diagnose the same, with probability, when the apoplectic attack is accompanied with general convulsions, contraction of the pupils, and death occurs in a few hours.

Respecting the medulla oblongata, it is only with approximate certainty that we can diagnose lesions here. The various cranial nerves are implicated, producing dysarthria, anarthria, dysphagia, aphonia, and disturbances of respiration and circulation. We may find either hemiplegia or paraplegia, but very little anæsthesia, as a rule.

In lesions of the crura cerebri we find a paralysis of the motor oculi, generally affecting all its branches on the same side with the lesion and opposite the contralateral hemiplegia of the extremities. In these cases the paralysis both of the extremities and of the motor oculi is sudden and simultaneous.

Respecting the corpus striatum we know that by far the greater number of cerebral hæmorrhages take place into this ganglionic centre, and we accordingly find generally as the symptoms of lesions here the typical hemiplegia.

We have, however, lesions affecting different localities of the corpus striatum as laid down by Nothnagel and Charcot. Lesions affecting the lenticular nucleus; the caudate nucleus; the anterior portion of the internal capsule; the posterior portion of the internal capsule; and finally, lesions affecting only the lenticular nucleus, or the optic thalamus, or the adjoining part of the island of Reil. The hemiplegia produced by hæmorrhage into the corpus striatum may gradually disappear if the lenticular or the caudate nucleus alone is involved. It is permanent if the internal capsule is affected either alone or with the gray nuclei. In these lesions of the internal capsules with the permanent paralysis we frequently find secondary contractures.

Respecting the cortex of the brain we may say that psychic dis-

orders in general point to a cortical lesion, and dysphagic and aphasic phenomena also point in the same direction. The third left frontal convolution may be supposed to be affected in simple ataxic aphasia. The third temporal convolution may be supposed to be the seat of the lesion in word-deafness. As I have previously stated, the motor disorders accompanying cortical lesions give evidence of the locality of the latter.

The forms of paralysis which we meet with as a result of cortical lesions are monoplegias, partial hemiplegias, isolated paralysis of the facial and hypoglossal nerves, of the arm, and rarely of the leg. As the result of hæmorrhage, softening, or the development of a tumor, we find certain forms of motor irritative phenomena—partial and limited convulsions. In cases where the motor irritative phenomena take on the character of epileptic attacks, the typically recurring spasm always begins in the same group of muscles in one extremity or one half of the face.

We know very little positively of the different operations of psychological and intellectual life, the phenomena of which have been but slightly noticed, and are open to discussion. Mental diseases depend upon a physical lesion of the central nervous system, and as there is a very close relation existing between the regular functional activity of a normal brain and the diverse functional manifestations in insanity, the study of the structure and functions of the successive ganglia which compose the brain is a matter of deep interest as well as necessity to students of psychology. The white substance of the hemispheres consists of medullated nerve-fibres of about 0.0026 to 0.0067 mm. in diameter, while at the surface of the larger ganglionic masses and towards the cortex some non-medullated fibres are seen. The fibres of the white matter are separated from one another by bands of delicate connective tissue—fibrillated sustentacular matter, in which are situated, at intervals, round or oval nuclei, smooth in contour and measuring 0.0093 to 0.0075 mm. These fibres of the white matter may be divided very properly in two classes: 1. Those having a radiating and converging direction or course; and 2. Those uniting the two halves of the cerebrum and forming the corpus callosum, which is properly to be looked upon as a physiological as well as an anatomical commissure, and it is often found to be absent in congenital idiots. The cortex of the cerebrum or gray matter of the convolutions is divided into several layers or laminæ, the number being variously estimated by different observers, among whom are

Koelliker, Arndt, Meynert, and Frey. The latter regards the cortex as divisible into six laminæ. The general plan of structure of the gray matter of the cerebrum is, primarily, a wide-meshed network of medullated fibres, in whose interstices ganglion cells are situated. We also find that very delicate network of fine fibres met with in the gray matter of the spinal cord, first discovered by Deiters, which consist of very delicate fibrillæ, springing from the broad protoplasm processes of the ganglion cell. These fibrillæ Deiters regards as a system of secondary axis cylinders for the most delicate nerve-fibres. Gerlach first described the network as occurring in the cortex of the cerebrum as in the spinal cord. The remainder of the gray matter is made up of the delicate sustentacular substance before alluded to as intervening between the fibres of the white matter. In the superficial layers of the convolutions the cells are small multipolar nerve-cells, analogous to the small cells in the posterior cornua of the cord, while in the deeper stratum, or fourth layer of Frey, are found large multipolar ganglion cells 0.025 to 0.040 mm. in diameter, presenting oval or roundish nuclei. These large cells correspond to the large cells in the anterior cornua of the spinal cord, which, it will be remembered, send out "axis cylinder processes," which are prolonged into the nerve-fibres of the motor roots. In like manner we observe, under the microscope, an "axis cylinder process" given off from these multipolar ganglion cells of the deeper layers of the convolutions of the cerebrum, which process is prolonged into one of the nerve-fibres of the corona radiata. It is, I think, demonstrable that there is a lateral anastomosis between the cells of each layer or lamina, and also anastomoses between the successive layers of the convolutions. Of course it is impossible to limit exactly the special attributes of any particular group of cells in the convolutions of the cerebrum, yet, by comparing them with the elements of the spinal cord, it certainly seems possible to make certain legitimate inductions relative to their diverse activities.

I have just stated that the large nerve-cells of the convolutions correspond to the multipolar ganglion cells of the anterior cornua of the spinal cord, which cornua are connected with the motor roots of the spinal nerves, while the small and superficial cells of the convolutions are analogous to the small cells of the posterior cornua of the cord, which are connected with the sensory roots of the spinal nerves. We have also seen that in both the multipolar ganglion cells of the deeper layers of the convolutions of the cerebrum there exist pro-

cesses which become the axis cylinders of nerve-fibres. I think, therefore, that we may fairly conclude that the superficial layers or laminæ of the convolutions of the hemispheres disseminate the impression of general sensibility, and that the deeper layers, containing the larger multipolar ganglion cells, originate motor impulses. It will be understood that in speaking of the structure and functions of the gray matter of the hemispherical convolutions I refer to the histological elements, the functional activities of which we are as yet comparatively unacquainted with.

The cerebral ganglia whose structure and functions remain to be considered are the corpora quadrigemina, thalami optici, and corpora striata. The structure of the corpora quadrigemina consists of a white layer overlaid with a zonal stratum of nerve-fibres. Underneath them the crura cerebelli and corpora quadrigemina pass on to reach the cerebrum, and should more properly be called, as Frey remarks, crura cerebelli ad cerebrum. Laterally there enter the corpora quadrigemina, from below, the two lemnisci arising from the motor tract of the medulla oblongata, and traceable back to the same tract or part of the medulla. In the anterior tract of the corpora quadrigemina, a root of the optic nerve, coming from the corpus geniculatum internum, terminates. Small nerve-cells are seen in the internal gray substance of the quadrigeminal bodies, with larger multipolar and fusiform ganglion corpuscles, the latter being said by Meynert to be found in the deeper layers of the anterior bodies about the aqueduct of Sylvius. The functions of these bodies are tolerably well understood, as they give rise to the optic nerves and act as the ganglia of sight, from which they have also been called "optic ganglia." Destruction of these bodies causes complete blindness. They thus serve as nervous centres for the perception of light, and a reflex action also takes place through them, by which the amount of light admitted to the eye is regulated to accommodate the sensibility of the pupil.

The structure of the optic thalami, like the corpora quadrigemina, consists of a white layer overlaid with a zone of nerve-fibres. The posterior end of these ganglia has been termed the pulvinar. Internally to it, and more posteriorly, is situated the corpus geniculatum internum, and, externally, the corpus geniculatum externum. Into the latter a portion of the optic tract passes on its way to the pulvinar. Fusiform cells are found more deeply colored than those of the corpora quadrigemina. The cells of the corpus geniculatum exter-

num are found to be frequently pigmented, and the internal geniculate body also contains fusiform cells. The thalamus receives numerous white fasciculi coming from the hemispheres. They run towards the superior surface of the thalamus, to the superior and internal border, and the pulvinar, and are ultimately lost in the same manner as are the fibres continued from the crus cerebri into the corpus striatum; that is, by a subdivision into close plexuses of extremely delicate nerve-fibres. The functions of the optic thalami have been but little understood, and there is still a great difference of opinion respecting the function of this great basilar ganglion. I regard it as the centre of general sensibility, and it is certainly a fact that all the sensory fibres go to terminate in the optic thalamus. It would seem proper, as Luys has done, to subdivide the optic thalamus into four special centres or ganglion tracts. Luys considers that the optic thalami receive, preserve, and transform the sensorial impressions previous to their definitive irradiation to the cortical periphery. The anterior ganglion tract, he considers, is undoubtedly connected with olfactive impressions. The middle ganglion tract receives the nerve-fibres of the second pair, and may properly be called the optic tract. The posterior ganglion tract, from its connection with the perception of sounds, may be called the acoustic tract. And there is undoubtedly another tract of the optic thalamus, which, from its close relation to the sensitive fibres of the convergent system, may be called the tract of general sensibility. Ferrier, who had, as a result of its destruction experimentally, produced anæsthesia of the opposite side, held it as a centre of conveyance, or an interrupting ganglion of the sensitive fibres, through which might pass all the fibres of the sensory nerves which have their origin beneath the cerebral peduncles. Crichton Brown, on clinical facts, regards it as the centre of general sensibility. Nothnagel, in his series of experiments, has not found, after destruction of the optic thalamus, lesion of sensibility or of voluntary motility. Meynert thinks, as the result of anatomical researches, that in the optic thalami the sensory impressions coming from the periphery are transformed into movements, so that the thalami would be automatic centres of reflex unconscious movements, and would also stand in some relation with voluntary movements. Flourens, Longet, and Schiff, as a result of experimental research, have attributed motor functions to the thalami. If this was so, and especially if, as has been claimed by Lusanna and Lemoigne, the optic thalamus, with its

median fascicles, was the centre for movements of the arm and hand of the opposite side, it would be a true secondary motor centre, subordinate to the psycho-motor centres of the cortex.

The structure of the corpora striata consists of a collection of gray matter, nerve-cells, and of fine nerve-fibres. They contain two larger nuclei, respecting which little has been known, and it is only lately that we have subdivided the corpus striatum into the lenticular and the caudate nucleus, with also the internal capsule and its functionally distinct sections, which were pointed out by Charcot. The greatest interest attaches to the corpus striatum, for it is here, as I have previously remarked, that by far the greater number of cerebral hæmorrhages take place, giving rise to the typical hemiplegia. The system of nerve-fibres is derived from the crura cerebri, running parallel in a straight direction, entering both nuclei, and ultimately lost in these nuclei. The surface of the corpora striata is gray, and in the gray matter we observe multipolar ganglion cells and smaller cells. The neuroglia is analogous to the neuroglia of the cortex of the cerebrum. There is also another set of fibres, proceeding probably from the medullary substance of the hemispheres, which ramify in the large nucleus of the corpus striatum. These fibres differ from those derived from the crus cerebri, which in this location are extremely attenuated and present a plexiform arrangement. Physiologists in the past have supposed the functions of the corpus striatum to have some connection with sensation and volition, although they have not attempted to explain the nature of the connection. As experimental observations have proved that destruction of the corpus striatum results in motor paralysis, with the preservation of intelligence, depending on the extent of the lesion; and also, as cases have occurred in which the functions of the corpus striatum having been not destroyed, but impaired by compression or degeneration of its elements, there have resulted disturbances in the motor sphere, may we not reasonably infer that the corpora striata are undoubtedly the centre of the reception, regulation, and elaboration of voluntary motor impressions emanating from the deep layers of the cortical matter whose large cells originate them? Such is the conclusion of Luys, and it is, I think, the correct one, judging from my own researches and observations.

There is no question more interesting to the student of mental pathology than that of the connection between nerve function and nerve organization, and it is only by the better knowledge of the

physiological laws of the brain that we can determine that connection; and it is only by patient experiment and observation that we are to fully understand the nature of the relation between the histology of the brain and the physical functions. It is impossible to fully appreciate the pathological changes met with in the brain until we are in full possession of all the available knowledge of cerebral histology and of the knowledge of the normal functional activity of nerve-cells, and we certainly cannot understand defective intellect unless we are thoroughly acquainted with the ordinary and normal manifestations of intellect. We must, therefore, clearly understand the physiological laws of healthy mental action before we can comprehend any departure from the healthy working of such laws. With this end in view have my efforts in the direction of the study of the physiology and pathology of the central nervous systems been made.

With respect to the functions of the cerebrum we should remember that we can, in early life, direct the growth of function. Dr. William B. Carpenter, of England, in writing on "The Hereditary Transmission of Acquired Psychical Habits," says: "It is when the brain is *growing* that the *direction* of its structure can be most strongly and persistently given to it. Thus the habits of thought come to be formed and those nerve tracts laid down which (as the physiologist believes) constitute the mechanism of association, by the time that the brain has reached its maturity; and the nutrition of the organ continues to keep up the same mechanism in accordance with the demands upon its activity, so long as it is being called into use. Further, during the entire period of vigorous manhood, the brain, like the muscles, may be taking on some additional growth, either as a whole or in special parts, new tissues being developed and kept up by the nutritive process in accordance with the modes of action to which the organ is trained; and in this manner a store of 'impressions' or 'traces' is accumulated, which may be brought within 'the sphere of consciousness whenever the right suggesting strings are touched.'"

CHAPTER X.

THE PATHOLOGY AND MORBID HISTOLOGY OF ACUTE AND CHRONIC INSANITY.

OPHTHALMOSCOPIC APPEARANCE AND EXAMINATION OF BLOOD AND URINE.

Membranes, Epithelium, Nerve-cells, Nerve-fibres, Special Morbid Conditions of Gray Matter, etc.—The morbid histological changes occurring in insanity are, at the present day, undergoing microscopical investigation at the hands of many very skilful observers, both in our own country and in Europe, and these assume great importance when we reflect upon the fact that the pathological phenomena discovered in the brains of persons dying insane, all have for their basis interference with the due nutrition, growth and renovation of the brain cell, which by interrupting the nutrition, stimulation and repose of the brain, essential to mental health, results in the impress of a pathological state in the brain and disordered mental function. The investigation of both the normal and the morbid histology of the brain is a work requiring great labor, patience and perseverance, and also judgment in the recording of observations; and even by the most careful and conscientious microscopists, mistakes may be made at times as to the nature and value of appearances met with in histological research. We may fairly divide the pathological changes met with in insanity into three classes, according to the plan of M. Parchappe, the Inspector-General of Asylums in France, who has made very careful and thorough investigations:

First. Those which may be considered accidental.

Second. Those which are found in other diseases, yet appear to be concerned in the production of insanity.

Third. Those essential to mental disease.

In the first class we may enumerate cerebral hæmorrhages, softening of the white substance, and disease of the cerebral vessels.

In the second class we meet with thickening and opacity of the arachnoid, hyperæmia of the pia mater and of the brain, serous infiltration of the pia mater, and collections of fluid in the arachnoid cavity.

In the third class, or the *changes essential to mental disease*, we find sub-arachnoid ecchymosis and a partial punctiform injec-

tion of the cortical surface, with or without softening; extended softening of the middle portion of the cortical substance; adherence of the pia mater to the surface of the brain; different discolorations of the cortical substance; loss of color of the cortical substance; atrophy of the convolutions; and lastly, induration of cerebral tissue.

The naked-eye appearances which we meet with in the bodies of those dying insane, are chiefly peculiarities in the form of the cranium, of which the most frequent is want of symmetry between the two sides; the shrunken and shrivelled ear in chronic insanity, consequent upon hæmatoma auris; variations from the normal standard in the thickness or thinness of the cranium; changes in the membranes; and finally, changes in the cerebral substance itself.

In acute insanity the changes or prominent alterations in the brain—as will be seen in the appended cases illustrative of the pathology and morbid histology of insanity—met with by the writer, have been: hyperæmic conditions of the brain and its membranes, which latter are often thickened and opaque; injection and softening of the cortical substance and pigmentation of the cortical gray substance. While the dura mater is very rarely thickened, its vessels are found to be dilated and irregular, and the coats of the vessels much hypertrophied. The arachnoid I have found to be thickened, to be the seat of hæmorrhage, and have often found it covered with fine granulations on its surface. The bloodvessels of the brain I have found to present thickening of the coats, thickening of the sheath or hyaline membrane, deposits between the adventitia and sheath, and proliferation of nuclei.

The neuroglia has been found to be the seat of various lesions in insanity, the principal of which are disseminated sclerosis or gray degeneration, atrophy, miliary sclerosis and colloid degeneration. The cerebral cells have been found to be the seat of atrophy, pigmentary or granular degeneration, calciferation and hypertrophy. In chronic insanity the changes chiefly met with in the brain, have been atrophy of the convolutions and brain itself, induration of both white and gray matter, thickening and opacity of the membranes, chronic hydrocephalus, effusions into the sub-arachnoid space, pigmentation of the cortical substance, and extended and profound sclerosis of the brain. The pia mater is found to be thickened and adhesive to the brain, and its vessels tortuous and thickened in their walls. I have also noticed atheromatous and fatty degeneration of the walls of the cerebral capillaries.

Having devoted considerable time and thought to the microscopic investigation of both the normal and morbid histology of the brain, I desire to call particular attention to an appearance which I have noticed in the brains of those dying insane, and to which my attention has been drawn, from the interest it assumes when viewed in the light of the probable ultimate cause of the nutritive defect which results in chronic insanity. We know that, for the proper nutrition and healthy functional activity of the brain-cell, is required the proper nutrient supply, and that we cannot have healthy mental function without a due supply of healthy blood to normal and healthy brain-substance. We also know if any agent operates to influence the circulation unfavorably, so that a morbid condition of the cerebral capillaries is induced, that we shall inevitably have resulting morbid changes set up and maintained in the cerebral cells. In previous writings on insanity I have called attention to the fact that a microscopic examination of blood from insane patients, as compared with an examination of blood from the same number of healthy persons, revealed in the blood of the insane a marked increase in the number of white blood-corpuscles.

In making microscopical examinations of brain-tissue from chronic insanity, I have noticed repeatedly in different cases lymphoid cells or white corpuscles, and also red corpuscles in small numbers in the membranes and in the substance of the brain itself, evidently having emigrated from the bloodvessels. From what I have observed, I think that, under conditions of inflammatory irritation of the brain, an emigration of lymphoid cells takes place on a large scale, the cells or corpuscles, by virtue of their vital contractility passing through the walls of the vessels and penetrating into the brain-tissue. It will be remembered that both Dr. Bastian and Dr. Blandford have noticed a plugging up of the bloodvessels by small embolic masses composed of aggregations of white corpuscles in insanity. Ekker found that the vessels of the gray matter were generally dilated in insanity, and Ramaer also noticed the same thing in the vessels of the pia mater, while Dr. Major has described a dilatation of the arteries in "brain wasting," a condition which appertains to chronic insanity. We have here two factors which operate, I think, in the production in the pia mater and the brain, of the lymphoid cells and in some cases of the red corpuscles; first, the undue predominance and accumulation in the bloodvessels of the white corpuscles which obstruct the capillaries, giving us as a result an im-

peded circulation and an increased pressure in the coats of the vessels; and second, the dilatation of the vessels before alluded to. These two conditions are favorable to the rapid emigration of the white and the red corpuscles through the walls of the vessels; and also perhaps the same condition may be produced at times by the obstruction in the capillary vessels becoming great enough to rupture them. The lymphoid cells must act undoubtedly as foreign bodies and a slow course of inflammation is set up. Such an inflammatory process must necessarily be of slight intensity and of long duration, and these collections of lymphoid cells undoubtedly tend to become developed into a fibroid structure, resulting in the induration of the brain which we meet with in chronic insanity. I am also forcibly impressed with the idea that we have here the solution of the problem as to the relation which exists between tuberculosis and insanity. Dr. Clouston, in the *Journal of Mental Science* for April, 1863, showed that of 828 patients who died with tubercular diseases at the Royal Edinburgh Asylum, 153 passed rapidly into the state of chronic insanity, the acute stage being of very short duration, the patients all manifesting a decided tendency towards chronicity. He also noticed that the prognosis relating to mental recovery was eminently unfavorable, and that apparent recoveries proved to be only remissions. In these cases, where the development of the two diseases seemed to Dr. Clouston to be nearly contemporaneous, was not the tuberculosis the result primarily of the escape or emigration of the lymphoid cells into the connective tissue of the lungs owing to this state of leucocythæmia in the patient? I think that this condition occurs more frequently than we are aware of, especially in persons who inherit the predisposing neurotic element or morbific force. That there exists such an hereditary neurotic or morbific element or force, present in both insanity and phthisis, I most firmly believe; and I also believe that there is a correlation of morbific force which renders these diseases mutually convertible. I have repeatedly seen this borne out by undeniable facts, children of one family being affected with both insanity and phthisis in many different instances. This theory that "hereditary diseases" depend on a correlation of morbific forces was first advanced by Dr. Winn, of London, England, in 1869, in his treatise on the *Nature and Treatment of Hereditary Diseases, with Reference to a Correlation of Morbific Forces.*

To return, however, more immediately to our subject. Respecting the dilatation of the vessels which I have before alluded to, it appears

to me that the general obstruction in the capillaries of the brain causes primarily, probably, a compensatory hyperæmia, and as this gradually becomes permanent the small arteries would naturally become enlarged, as they have been found to be by Ekker, and Dr. Major, and also myself; and their walls would become thickened, as we find them to be in post-mortem, in chronic insanity. Such long-continued mechanical hyperæmia causes an impairment of vitality and function, and this we find exemplified by the retrogressive changes which occur in the substance of the brain in chronic insanity, viz., atrophy, induration, and degeneration of the nervous elements of the brain. With the exception of cases of apoplexy in which large clots have been discovered post-mortem, I am not aware that any observer has described any such lymphoid deposit in the brain, which may or may not have undergone fibroid metamorphosis or degeneration.

I think, therefore, that from both a physiological and pathological standpoint, these observations become of the highest clinical significance. (I desire not to be misapprehended as regarding the presence of the lymphoid deposits in the brain as the ultimate cause of insanity.) I do, however, think that by their presence we are enabled to explain many of the changes incident upon chronic insanity, and think their presence must affect very materially the ultimate molecular changes in the brain, upon which its functional activity depends, and regard it as a very strong probability that such foreign deposits in the brain may, by interfering with the molecular changes just alluded to, destroy both functional excitability and activity. It would appear very probable that the prominent alterations taking place in chronic insanity, viz., atrophy of the convolutions and of the brain itself, and induration of the two substances, with degeneration of the nerve-cells, may fairly be considered to depend upon this abnormal relationship between the blood and the tissues, which becomes the ultimate cause of the nutritive defect which results in chronic insanity.

Ophthalmoscopic Appearances in Insanity.—The ophthalmic appearance is reported by Klein* in 134 patients, of whom 42 were affected with general paralysis, 19 with mania, 19 with epilepsy, 17 with alcoholism, 4 with apoplexy, 6 with melancholia, 1 with locomotor ataxia, and 26 with divers forms. In 89 cases positive results were obtained, which he divided into two categories—one of 31 and the

* Wien. Med. Presse, 1877, No. 3 (Abstr. in Central Blatt., No. 29).

other of 58 cases. In the first class Klein found 9 times retinitis, 8 times discoloration of the optic nerve, 6 times atrophy, and 8 times hyperæmia of the retina. The second class consisted of 29 congenital anomalies and 29 cases of a peculiar opacity, resembling the senile metamorphosis of the retina. Since this change was found in 18 cases out of 42 of general paresis, Klein terms it retinitis paralytica. During an epileptic attack he observed retinal ischæmia and clonic spasm of the iris. The conditions of the retina in acute dementia and atonic melancholia are those of anæmia, the optic disks being pale, the tint of the choroid being lowered, but not resembling atrophy. In atrophy there is more of a sharpness and brilliancy of pallor than in dementia and melancholia. The retinal vessels are small and shrunken, but no trace of previous tortuosity is apparent, as is often seen in atrophy. In senile atrophy of the brain the cells, through the entire depth of the cortical layer, are morbidly affected; in the larger nerve-cells the process is one of granular degeneration, but in the smaller cells there is simple atrophy without degeneration. The nuclei of the cells are degenerated, and ultimately become destroyed; also the branches of the large cells at an early period. The large vessels and capillaries are dilated, and the vascular canals are enlarged, and the surrounding cerebral substance is indurated. The fibres are abnormally coarse and tortuous, and, in some parts, broken down. The neuroglia, which includes the delicate, almost homogeneous matrix supporting the nerve elements, is in a state of atrophy and degeneration, and the corpuscles increased in number, but they eventually shrivel and atrophy.*

Examination of Blood and Urine.—A microscopical examination of blood from insane patients as compared with an examination of blood from the same number of healthy individuals revealed, in the blood of the insane, a condition of leucocythæmia, or a marked increase of the number of white corpuscles. This condition has also been remarked by other observers, and Dr. Charlton Bastian and Dr. Blandford have described a plugging up of the cerebral vessels by small embolic masses composed of collections of white corpuscles in cases of acute mania and delirium. It has been found that, during the period of maniacal excitement, there is a marked diminution of

* Acute cerebral hyperæmia may induce a congestion of the optic papilla. I have failed to find in mania, melancholia, and dementia, any constant reliable changes in the eye, while in general paralysis of the insane, I have seen atrophy of the optic nerve frequently.

fibrin in the blood, and during convalescence the amount of fibrin is increased to the normal standard. These results have been confirmed by the recent researches of Hittorf, Erlenmayer, Michea, and Dr. Marcet. Examination of the urine in insanity has shown that in acute mania there is an excessive elimination of the phosphates, as a rule, while in dementia, general paralysis, and chronic mania the amount of phosphates eliminated is generally below the average. There has been some difference of opinion in different observers as to the reaction of the urine in insanity, Erlenmayer claiming that it is generally alkaline in recent cases of mania, while Dr. Sutherland, who has paid great attention to the condition of the urine, found that, in 125 cases of recent mania, the urine was acid 101 times, and alkaline 13 times, and gave a neutral reaction once. In our investigations we have found the reaction to be acid in the majority of cases of those affected with acute and chronic mania and dementia.* The small amount of time at the disposal of a physician in charge of an institution for mental diseases, and the difficulty of making an extended course of investigation in the analysis of blood and urine which is so desirable, and also the difficulty of making microscopical researches, are causes which have combined heretofore to deter the superintendents in this country from giving to the profession the results of their valuable experience, and it is therefore to be hoped that the time is not far distant when every asylum shall possess the services of a skilled pathologist and chemist.

Dr. J. Batty Tuke, in writing on the morbid histology of insanity, says: "One great difficulty which presents itself to the mind of the cerebral pathologist is to determine whether the morbidities which are apparent on microscopic examination are of a primary or secondary nature; whether they have been efficient causes of insanity, or whether they are merely the results of malnutrition of the brain, and, as such, efficient causes of chronic lunacy. There exists an undetermined point in anatomy which, until settled, must leave the question, to a certain extent, open; that point is the presence or absence

* I have seen the most intense melancholic depression, associated with the persistent presence of oxalate of lime in the urine, and the melancholia has rapidly dissappeared upon the free exhibition of the dilute nitro-muriatic acid, which caused a disappearance of the crystals of the oxalates in the urine, as viewed under the microscope. In cases of languor, depression, and melancholia, with perhaps, slight vertigo, we should always look for the oxalate of lime with the microscope. We do not think there is an increased quantity of phosphates in the urine in healthy individuals after brain work. The turbid urine is due to diminished acidity.

of cerebral lymphatics. When it is considered that the brain is an exceedingly active organ, performing many and various functions, and when it is further considered that it can obtain no vicarious aid in the performance of those functions,—that it cannot, like the lungs, seek assistance from other systems,—it must be at once apparent that the question of its possession of an overflow for getting rid of superfluous plasm and waste products is of paramount importance. Fohman and Arnold demonstrated to their own satisfaction the existence of a system of lymphatics in the pia mater, and His, Obersteiner, and Boll believe that the pia matral envelope of the cerebral arteries (hyaline membrane) exercises the function of a lymphatic duct. The very existence of such a sheath or envelope has been called in question, but comparatively slight study is needed to make its demonstration certain. Although differences of opinion exist as to its relations and manner of debouchment, we believe that it terminates by funnel-shaped openings into the spaces which exist over the sulci, between the pia mater and the so-called arachnoid membrane. Kölliker has pointed out that the connection between the pia mater and arachnoid over the convolutions is so complete and perfect that only in parts, namely, over the sulci, a distinct space can be shown to exist. It is questionable whether the arachnoid should not be considered to be merely the outer layer of the pia mater. In prosecuting the study of the morbid histology of the brain and spinal cord two methods of investigation should be adopted: 1. The examination of the tissues in a fresh state. 2. The examination of the parts *in situ* by means of sections made after submission of portions of nervous tissue to hardening agents. The condition of the constituents of the recent brain can best be observed by coloring small specimens with rosaniline. The modern method of freezing and section by means of the microtome designed by Mr. Bevan Lewis, has rendered the investigation of histological brain changes a comparatively easy task.

The Membranes.—The dura mater is, comparatively rarely, thickened by proliferation of its elements. The vessels are found to be irregularly dilated and tortuous, with thickening of their walls. The arachnoid and pia mater are in such close anatomical relation on the convexity of the hemispheres that they can be best described together. Between them, supported by a delicate connective tissue, lie the bloodvessels, which dip into the sulci, carrying with them an investment of pia mater, which gives prolongations to accompany them

when they pierce the cerebral substance and form the so-called hyaline membrane. Over the sulci are the spaces usually termed subarachnoid, which communicate with each other by conduits accompanying the vessels. The microscopic appearances of "milky arachnoid" have not been thoroughly described. Both membranes are often thickened, presenting a laminated appearance, and the connective tissue supporting the bloodvessels is considerably increased, as well as the pia matral prolongations accompanying the bloodvessels into the cerebral substance, which loses its hyaline character and becomes distinctly fibrous. Extensive but thin blood-clots are occasionally found within the arachnoid and pia mater, while more rarely extravasations of blood are found between the pia mater and the cerebral substance.

Deposits of hæmatoidin often surround the vessels, and their coats are frequently hypertrophied. Crystals of triple phosphate have been seen on the visceral surface of the pia mater. Lymph has been found between the pia mater and the spinal cord; the membrane was thickened, and internal to it were numerous distinct laminæ of a finely fibrillated material, in some places $\frac{1}{200}$th of an inch in breadth.

The Epithelium.—The ground-glass appearance frequently seen in the ependyma of the ventricles is due to three different morbid conditions, which are, in the order of their frequency, proliferated epithelium, lymph exudations, and crystalline deposits. When change in the epithelium is the cause of the granulations, a vertical section shows simply a proliferation of cells projecting into the ventricle like villi.

When lymph exudations have pushed the ependyma upwards it presents the appearance of rough, irregular, bullæ-like nodules, consisting of the layer of proliferated epithelial cells and a greenish, homogeneous stroma, which together overlie the pia mater; the same material can be frequently seen infiltrating the subjacent cerebral tissues. Deposits of phosphate of lime have been recorded as occurring beneath the ependyma of the lateral ventricles in general paralysis, and Bergmann discovered a formation of pretty large crystals of "double phosphate" in both plexus choroidei in a case of mania with mental weakness. A proliferation of the columnar epithelium of the central canal of the medulla oblongata is not unfrequent, causing its occlusion.

The Nerve-cells.—The changes in the nerve-cells are most marked in the anterior two-thirds and superior parts of the hemispheres, as

in this situation they are usually most numerous and large in size. In the depending portions of the hemispheres and the occipital lobe few, if any, changes have been noticed. The special morbid conditions of the nerve-cells are: *a.* Atrophy, or pigmentary, granular, or fuscous degeneration. *b.* Hypertrophy, calcification. Pigmentary, fuscous, or granular degeneration is a very common condition in many forms of insanity, particularly senile insanity and general paralysis, and is probably, to some extent, a normal senile change. Dr. Major distinguishes three stages: 1. The cells lose their sharply-defined, triangular outline, and become swollen or inflated in appearance; the process running towards the periphery of the convolution usually remains distinct, but the other processes disappear and the cell becomes rounded off; the nucleus becomes swollen and more or less round or oval, and the nucleoli are seen with great distinctness. 2. A deposit of granules takes place, either external to the cell and pressing upon it, or in its interior, until it becomes more and more yellow and opaque; or both these conditions may occur together. 3. The cell goes on to destruction, breaking down and shrinking, leaving the nucleus surrounded only by a mass of granules, and forming a gap in the cerebral tissue formerly occupied by the swollen cell; still later the granules entirely disappear, leaving the nucleus free. He has not observed the nucleus actually undergoing disintegration, but often no trace of it is to be found in the mass of granules left by the degenerated cell. Hypertrophy of the large pyramidal cells of the inner layer has been observed in senile atrophy and general paralysis; as the name implies, they are large, abnormally distinct, and swollen in appearance, often presenting granular masses in their interior; the processes are increased both in size and number; and the angles of the cells may be greatly prolonged, or swollen and stunted. Calcification of the cells by the deposit of phosphate of lime within their walls has been observed, according to Blandford.

The Nerve-fibres.—The chief changes in nerve-fibres, apart from their disintegration by apoplexies, softenings, etc., are coarseness, irregularity, and twisting of outline, and their power, in the fresh state, of resisting pressure under a covering-glass, some being readily ampullated. They may be affected by a pigmentary degeneration similar to that occurring in the cells; and, finally, they may present fusiform or oval swellings, which tint strongly with carmine, and give rise to the appearance known as amyloid bodies.

Special Morbid Conditions of the Gray Matter.—In many subjects, when the pia mater is thickened and hyperæmic, a condition of the gray matter closely resembling gray degeneration in the white matter is often found; it differs from the latter by the absence of proliferated nuclei, and is strongly suggestive of lymph infiltration, which has gradually caused atrophy and absorption of the normal structures. Circumscribed spots of yellow softening show under the microscope ragged fibres, colloid bodies, and granular corpuscles at the base of the diseased tract. Local atrophies of the convolutions are pretty common. Under the microscope a thin layer of indurated gray matter, presenting no trace of normal structure, may be found. In other cases there is simple absence of the gray matter, the white matter in both being unaffected.

The Neuroglia.—This substance undergoes inflammatory changes of a subacute or chronic nature, with the results of which we are familiar as more or less diffused *sclerosis*. Together with the other elements of the cerebral tissues, it undergoes atrophy in the brain wastings of senility, and especially of senile dementia; it is also liable to special forms of degeneration, which have been called miliary sclerosis and colloid degeneration, though those terms are somewhat misleading, as the changes in question differ entirely from those generally described by these names.

General Sclerosis has only been observed in one case, which is fully detailed in the *Journal of Anatomy and Physiology*, May, 1873.

Disseminated or Partial Sclerosis, or Gray Degeneration, is a lesion frequently met with in the brains of old-standing cases of insanity, especially in general paralysis. Its most frequent seat is the white matter of the motor tract; less frequently it is met with in the hemispheres. In the pons varolii, medulla oblongata, and spinal cord of epileptics, patches of this disease are of common occurrence, and in an extreme degree. When a fine section of nerve-tissue affected by this disease is examined by the naked eye, circumscribed opaque patches can be seen; in colored sections these tracts are strongly tinted. As a rule, they are found contiguous to a vessel, whose nuclei are much proliferated and around which considerable proliferation of the nuclei of the neuroglia exists. Under the microscope the nerve-fibres are seen to be partially or completely atrophied; the axis cylinders and sheaths are destroyed, and the field is occupied by a finely molecular and fibrillated material imbedded in a cloudy, homogeneous plasm. In this matrix the proliferated nuclei

exist, somewhat enlarged sometimes, slightly granular in appearance; but around the implicated spot they are to be seen in much greater quantity and not actively diseased. The atrophied nerve-fibres occasionally project raggedly into the gray matter, where they are lost. Rokitansky believes this to be essentially a primary increase of the neuroglia. Leyden thinks it occurs secondarily to the atrophy of nerve-fibres, while Rindfleisch and others are of opinion that the first stage is marked by proliferation of the nuclei of the vessels, which is followed by an increase of the neuroglia and the development of a morbid plasm, which is, in all probability, modified neuroglia.

Miliary Sclerosis.—For the full details of this remarkable lesion the reader is referred to the *Edinburgh Medical Journal* for September, 1868, and to the *British and Foreign Medico-Chirurgical Review*, July, 1873. The following is a short account of its principal features: It is not confined to any one class of mental disease, but has been found best marked in cases accompanied by paralysis or epilepsy. It differs from all other lesions termed sclerosis in not being preceded, attended, or followed by proliferation of the nuclei; it is a circumscribed lesion, occurring in patches from $\frac{1}{40}$th to $\frac{1}{1500}$th of an inch in length, not involving surrounding tissues except by displacement, diffusing no morbid plasm beyond its own area, and not connected with the bloodvessels. It is essentially a disease of the nuclei of the neuroglia, and its progress is marked by three stages: 1. A nucleus becomes enlarged and throws out a homogeneous plasm of a milky color, and apparently of a highly viscid consistence, forming a semi-opaque oval spot, usually unilocular; but by aggregation the spots may be bilocular, or, more rarely, multilocular; in the centre of these spots a cell-like body containing a nucleus is discernible—the original dilated nucleus of the neuroglia. 2. The morbid plasm becomes distinctly molecular and permeated by fine fibrils; as it advances, the plasm around the periphery of the spot becomes more dense and a degree of absorption of the nerve-fibres around it takes place. 3. The molecular matter contracts on itself, becomes more opaque, and often falls out of the section, leaving ragged holes.*

Colloid Degeneration may be either a primary or a secondary product; that is to say, there is reason for believing that in certain forms of insanity it is the primary pathological change, and that it is

* The reader is referred to the micro-photographs, where one of them, marked "section of brain from case of chronic insanity," taken from a case of homicidal mania, where there was suspected epilepsy, shows this lesion very markedly in the third stage.

also to be met with in the brains of chronic cases, a result of long-continued perverted vascular action. It has been produced artificially in the brains of pigeons by incising them and allowing them to heal. This degeneration should be searched for in recent specimens. It consists of round or oval bodies from $\frac{1}{4000}$th to $\frac{1}{2000}$th of an inch in diameter, and bounded by a distinct wall containing a homogeneous, transparent, and colorless plasm; sometimes it is somewhat granular. The general appearance of a section may be compared to a slice of cold sago pudding; it cannot be colored by carmine. The condition may be regarded as a degeneration of the nuclei of the neuroglia, and is found in both gray and white matter.

The Bloodvessels.—When we examine an injected preparation of the substance of a cerebral convolution and witness the perfection and delicacy of its circulatory apparatus, and when we reflect on the results of the phenomena of congestion, stasis, and anæmia on the functions of other organs, we have little difficulty in comprehending the influence such conditions must have upon the highly complex elements which make up the organ of the mind. It is certain that in most cases of recent insanity disturbance of the cerebral circulation is one, if not the essential, pathological factor, and if such disturbance is of long continuance, permanent lesions of cells, fibres, and nuclei, and, as a consequence, chronic insanity in some form must result. The examination, therefore, of the cerebral vessels is of primary importance. The following is the method of examination adopted by the writer: After noting the degree of engorgement or anæmia in the centrum ovale, and whether, on section, the vessels are dragged out by the knife, vessels of moderate size should be dissected out, and carefully washed with camels-hair brushes, and then submitted to the microscope. By this mode of procedure the following changes may be discovered:

(*a.*) Thickening or degeneration of one or other of the coats.
(*b.*) Thickening of the sheath or hyaline membrane.
(*c.*) Deposits between the adventitia and the sheath.
(*d.*) Proliferation of the nuclei.

(a.) *Thickening or degeneration of the coats.* The *inner* fibrous coat has been found thickened and more fibrous than in health. The *muscular coat* is often hypertrophied, especially the circular fibres; it is best marked in general paralysis and epilepsy. The *adventitia* is occasionally thickened. The whole of

the coats sometimes undergo a hyaloid or vitreous change, which is probably allied to lardaceous disease.*

(b.) *The hyaline membrane or sheath* is often thickened and fibroid, enveloping the artery in a loosely sacculated manner.*

(c.) *Deposits* between the adventitia and the sheath are of two kinds, but neither is peculiar to insanity, being found in the brains of persons who have died of fever or Bright's disease with cerebral symptoms. The first is a finely molecular material of a pale yellow tint, or more often colorless, closely resembling in appearance the spores of the favus fungus, and refracting light highly; it undergoes no change when treated with the ordinary oil tests, and is found in the smallest capillaries. The particles vary in size from $\frac{1}{4000}$th to $\frac{1}{7000}$th of an inch. The second form of deposit consists of irregular crystals of hæmatoidin, distributed pretty equally over the vessels, except at the bifurcations, where they are aggregated.

(d.) *Proliferation of the nuclei* usually accompanies proliferation of the nuclei of the neuroglia; they do not seem to increase to the same size as those of the neuroglia, but become oval or irregular in shape.

Fine sections of hardened tissues are necessary for the demonstration of the following vascular changes:

(*e.*) Abnormalities in direction.

(*f.*) Dilatation, microscopic aneurism, and apoplexies.

(*g.*) Perivascular spaces.

(*h.*) Syphiloma.

The *sympathetic ganglia* undergo a pigmentary degeneration in various forms of cerebral disease. The fact of Dr. Tuke being one of the most talented of cerebral pathologists will account for the length with which his observations have been cited.

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* Both of these appearances will be found typically displayed in our micro-photograph, showing the thickened bloodvessel in the thickened and infiltrated pia mater. Proliferation of the nuclei is also seen.

Explanation of Plate of Microscopical Sections of Brain and Spinal Cord.

No. 1 is a section of the normal spinal cord, for purposes of comparison with the diseased cord in General Paralysis.

No. 2 depicts the microscopic appearance in a case of chronic insanity, with the "cribriform" appearance of the brain, produced by the pushing out or dilated condition of the brain tissue by dilated blood-vessels in repeated attacks of cerebral congestion.

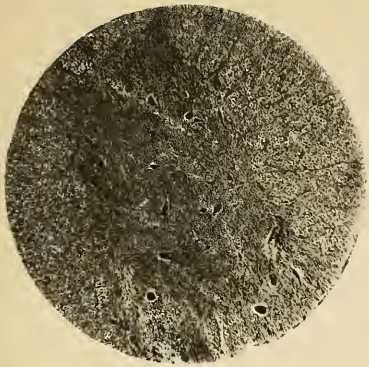
No. 3 represents the same portion (anterior cornua) of the cord from a case of Syphilitic Insanity. We see a loss of the nerve cells and also destruction and breaking up of the nerve substance.

No. 4 also represents the brain with attached Pia Mater, from a case of chronic mania. The Pia Mater A is seen to be thickened and infiltrated while the brain tissue exhibits the condition of the brain tissue surrounding blood-vessels, resulting from long-continued congestive dilatation of vessel.

No. 5 represents loss of nerve cells and elements in posterior column of spinal cord. In the place of the nerve cells is seen a new connective tissue-like substance, which lies imbedded here and there in irregular plates.

No. 6 depicts miliary sclerosis of the brain in a case of chronic insanity. This is a disease of the neuroglia of the white matter of the brain. This microscopical section represents the disease in its third stage, when the molecular matter contracts on itself, becomes more opaque, and falls out of the section, leaving ragged holes. Miliary sclerosis is a circumscribed lesion not involving surrounding tissues.

1



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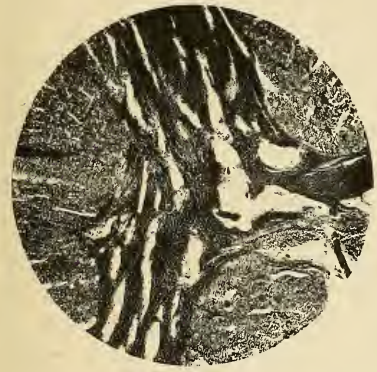

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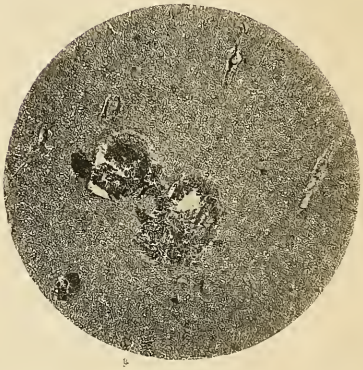

Micro-photographs of the Brain and Spinal Cord, taken by the author.

CHAPTER XI.

CASES ILLUSTRATING THE PATHOLOGY AND MORBID HISTOLOGY OF INSANITY.

The following cases are some of those in which I have had an opportunity of making a post-mortem examination, and will, therefore, be of practical interest to the profession:

Case I. *Melancholia with Delusions.*—Death resulting from chronic meningitis. C. McC., male, aged 44 years; single; occupation, porter. Upon his admission to the asylum he was noisy and maniacal. The state lasted but a few days, and he then became depressed and melancholy. He refused food for a number of days and had to be fed artificially. The melancholia assumed an acute form and he had hallucinations of sight and hearing, causing, at times, great terror and mental excitement. At such times, when he imagined he saw devils in the ward, his face would assume an aspect of the utmost fear and distress. He often expressed a wish to commit suicide. He died quite suddenly about five months after his admission, having eaten and slept but little for some days previous. *Post-mortem:* Upon removing the calvarium the dura mater was found to be adherent to it; the pia mater was thickened, infiltrated, and hyperæmic; the arachnoid was clouded and covered with granulations; the brain was hyperæmic and the cortical substance softened; the lateral ventricles were filled with fluid; the lungs revealed commencing tuberculosis; the kidneys, spleen, and liver were normal.

Case II.—M. H., male, aged 31, single, and by occupation a laborer. He suffered from melancholia. He had delusions of fear and persecution, and suicidal impulses. Often refused food, saying he wished to die. The mental faculties were very feeble, and the enfeeblement gradually increased. The bladder became paralyzed and the health gradually failed for about eight months, when he died from exhaustion. *Post-mortem:* The membranes were found to be adherent to each other, and the pia mater was thickened and adherent to the surface of the brain. Throughout the brain were small miliary tubercles; the substance of the brain was softened near the base; there was also considerable effusion about the base of the brain and effusion in the lateral ventricles; lungs normal; kidneys congested; spleen, liver, and heart normal.

Case III. *Melancholia with Religious Delusions and Hallucinations of Sight and Hearing.*—Death resulting from acute tuberculosis and rupture of pulmonary artery. J. S., aged 20, single; occupation, laborer. Upon admission to asylum was in poor physical condition, having never regained his strength since an attack of pneumonia some months previous. There was dulness at the apices of both lungs, and a prolonged expiratory murmur, with difficult respiration. He was very much depressed and melancholy, and said that he had committed unpardonable sins and should be eternally lost. At night he imagined he was visited by evil spirits, who tormented him. He died suddenly five months after admission to the asylum of which he was an inmate. *Post-mortem:* Dura mater firmly adherent to the skull; the meninges were congested and the vessels enlarged; the brain revealed softening of the cortical substance and effusion of fluid in the lateral ventricles. Examination of the lungs revealed the existence of tuberculosis. The upper and the middle lobes of the right lung were partially destroyed, and the sudden death was found to be the result of rupture of the upper branch of the right pulmonary artery in the middle lobe of the right lung.

Case IV. *Dementia and Paresis.*—Death resulting from pulmonary hæmorrhage. T. A., male, aged 22 years, single; occupation, wagon-maker. Upon his admission to the asylum was demented, with symptoms of paresis. Laughed vacantly when addressed, and stared unmeaningly about him. No appreciation of condition or surroundings. His gait was staggering and his lips and tongue were affected with muscular tremors. He never spoke but once, and that was upon the occasion of a visit from his brother. His speech at that time was hesitating and trembling. He had an attack of subacute meningitis four months after his admission, and died three months later from an exhausting hæmorrhage from the lungs. *Post-mortem:* The membranes were found to be adherent to the skull; there was subarachnoid effusion and a large effusion between the pia mater and the brain; the pia mater was thickened in patches; there was effusion at the base of the brain, fluid in the spinal canal, and the spinal cord was atrophied; there was a miliary tuberculosis throughout the brain. Upon making an examination of the chest the left lung was found to be partially destroyed by the breaking down of the caseous products of pneumonia, as a result of which large cavities were formed. The heart gave evidence of recent endocarditis. The surface of the heart and endocardium were covered

with miliary tubercles. The walls of the heart were atrophied, and exhibited traces of fatty degeneration. The kidneys, spleen, and liver were all normal. Upon hardening the spinal cord, and making thin sections, and employing carmine staining, there was found to be, upon microscopical examination, atrophy and degeneration of the nerve-elements of the posterior columns, with increase of connective tissue. Sections of hardened brain-tissue being made, there was observable in the cerebral cells of the frontal convolutions (after staining) a diffused granular degeneration; also diffused collections of the lymphoid cells, alluded to previously, most of which had undergone a fibroid metamorphosis. No change could be detected in the cells of the cervical sympathetic, which was carefully examined.

Case V.—M. A. R., female, aged 29, single; occupation, servant. Admitted to asylum with dementia, which ended in paresis. Speech was slurring and hesitating, and her gait was staggering. She suffered from gradually progressing paralysis, which involved the sphincters of the rectum and bladder. The cutaneous and muscular sensibility was impaired, and there was loss of electro-muscular contractility, so that disease of the antero-lateral and posterior columns of the spinal cord was diagnosticated before death. The paresis was attributed to spinal injury received when quite young. She died from exhaustion four months after her admission to the asylum of which she was an inmate. *Post-mortem:* The dura mater was firmly adherent to the cranium, the pia mater was thickened and infiltrated, and the arachnoid thickened and opaque. The convolutions of the brain were atrophied and the brain-substance indurated. There was fluid in the spinal canal and the cord was slightly atrophied and softened in patches. The uterus was in a rudimentary condition, apparently never having been developed properly. The spinal cord, after being hardened and sections made, revealed, upon microscopical examination, loss of neuroglia and connective tissue, degeneration of the posterior columns, and loss of nerve-tubules of white substance. The ganglion cells of both anterior and posterior cornua were atrophied and disintegrated, and granular and fatty matter occupied their place.

Case VI. *Dementia and Epilepsy.*—Death taking place after a succession of paroxysms. O. M. S., male, aged 19; occupation, gardener. Was admitted to the asylum of which he was an inmate with epilepsy associated with mania, which preceded and followed the paroxysms, requiring sometimes mechanical restraint. Dementia soon resulted

from the mental deterioration. The patient had epileptic fits nearly every day, which condition had been going on for years. He also inherited the predisposition to epilepsy. During the mania he imagined himself to be the Emperor of Germany. The paroxysms increased in frequency and intensity, in spite of all medication, for eight months, when he had a succession of fits lasting thirty-six hours, during one of which paroxysms he died. *Post-mortem:* Membranes of brain thickened; arachnoid and pia mater thickened; brain atrophied and indurated; lateral ventricles filled with fluid; spinal cord normal. Upon hardening the brain-tissue and medulla oblongata and examining microscopically, there was seen to be some vascularity in the fourth ventricle, which extended through the medulla, the capillary vessels of which were somewhat thickened and enlarged. The cervical sympathetic was also subjected to a careful microscopical examination, but without satisfactory results.

Many more interesting cases might be given, but want of space forbids. In closing this record of examinations I desire to insert the post-mortem appearances of a very interesting case, in which insanity and phthisis were contemporaneous in their development:

Girl, aged 23. Dementia, paresis, tuberculosis. *Post-mortem:* Pulmonary tuberculosis, with cavities at apices of both lungs. Brain atrophied, anæmic, and indurated, being the result of the lymphoid deposit, as proved by microscopic examination. Upon hardening the cord the posterior sections of the lateral column were found to be affected. The posterior column presented atrophy and disintegration of nerve elements and plates of connective tissue in different places. In the postero-lateral column were granular and fatty corpuscles and new bands of connective tissue. It being a rather difficult matter to harden the very delicate tissue of the brain so as to be enabled to cut sufficiently thin sections for demonstrating the finer structural relation of the tissues, the writer gives the formula employed by him for a hardening fluid for the brain and spinal cord, which in its effects surpasses any other, and better prepares the tissues for the reception of staining fluids. It is as follows:

℞. Bichromate of ammonia, ... 160 grs.
Methyl alcohol, ... 10 oz.
Distilled water, ... 30 oz. M.

CHAPTER XII.

TREATMENT OF INSANITY.

General Principles—Necessity of Prompt Treatment—Curability of Insanity—Statistics of various Asylums and their Views of Treatment—Moral Treatment—Food, Work, and Amusements—Clinical Lectures in the State Hospitals for the Insane—Mechanical Restraint—Maudsley's Views—Dr. Isaac Ray's Views—Medicinal Treatment—Cases Illustrating Treatment.

General Principles.—The indications for treatment in mental disease are, as Dr. Blandford has admirably shown, "To restore to health the disordered brain; to cause the incessant waste to cease; to promote a storing and not an expenditure of nerve-force. The brain must be nourished by healthy blood. The quantity of the latter when in defect must be increased; when its quality is in fault, it must be improved, and when the blood-flow is in excess, it must be checked; while all causes of disturbance reacting upon the brain from other organs of the body must be removed. Fresh scenes and faces, and the cessation of work and worry will often effect a cure." The removal of the patient suffering from mental disease from his immediate surroundings, although not necessarily to an asylum, is generally necessary for his cure, as the outbursts of anger and the delusions connected with those nearest and dearest are antagonized by the moral effect of the change; and if the case is promising and early treatment adopted, a cure will probably result. As a rule, patients are not placed promptly enough under adequate and appropriate treatment. A great deal of painful emotional distress is avoided by removing the patient to fresh surroundings as quickly as possible, and one of the greatest essentials is good and abundant food, to which allusion will be hereafter made in this chapter. If the patient is dangerous to himself or others, a well-regulated public or private hospital is evidently the appropriate place for him. The tendency of nature in this disease is to restore herself to the normal, we must therefore check the great expenditure of nerve material and see that the food contains as far as possible, and in a readily assimilable form, all the materials required to supply this waste. We must remedy impaired digestion, build up the nervous centres, regulate

vitiated secretions, see that our patient gets plenty of sunlight and pure air, and above all, our patient must have *time* for nature to build up nerve-cells capable of functional energy. If many patients took no medicine, but merely submitted themselves to hygienic conditions and surroundings, and took the necessary *rest* and *time*, during which there should be no demand upon the nervous energies, and took food suitable for their nervous centres, nature would, I think, antagonize the atonic functional state of the whole nervous system, in many instances, and might make good recoveries. The use of nerve-foods, dietetics, and hygiene, and above all, moral treatment, are perhaps somewhat underrated in the treatment of diseases of the mind, and it certainly requires a good deal of wisdom to know when not to interfere with Nature in her effort to restore the mental equilibrium of a case of insanity. Nature, by her own laws, is capable in some cases, if not too much interfered with, of disintegrating and reconstructing cellular material that has become unfit for the manifestation of vital phenomena, and restores lost psychical as well as physical force. If we remedy the inadequate nerve nutrition, which is the cause of the cerebral neurasthenia, which is the first link in the chain of mental disorder, we may trust to time and nature to accomplish much for our patient. There is a power in music, color, beauty, to tranquillize excitement, reanimate hope, diffuse joy, and dispel perversion of thought, all of which is manifested in the re-establishment of sanity. These agencies have power to reach consciousness and overthrow diseased action.

The physician should be the counsellor, companion, and friend of the patient mentally diseased, and he will certainly have to exercise forbearance, attention, and sleepless watchfulness towards his charges if he is to restore order where there is mental chaos. The motive, impulse, and conduct of the patient mentally diseased require to be analyzed by the physician in charge. The patient must be taught to discriminate as soon as possible between what is sound and sane and what is diseased and abnormal, and the mental and moral nature guided aright. He needs the highest intelligence and sympathy of his physician, whose very presence should suggest hope and cure, as much as he needs drugs and therapeutic agents. In the treatment of mental disease it is as important to reach the external senses by which moral agents may travel, as it is to reach the nutritive and assimilative functions which may convey physical agents into the system. In treating those who inherit their insanity,

we should remember that we must set in action for our patient new forces to counterbalance those already set in action before them, and so find a new equilibrium for our patient, so that he is once more in harmony with his surroundings. We have to meet the potentiality of force in these cases and neutralize or counterbalance it by setting some new force in action. We can greatly modify inherited tendencies, and by continuous effort other forces may be brought to bear upon the centric nervous system until a radical change in the whole system is brought about. We shall have to teach our patient very often to conquer his lower impulses, and to struggle with natural tendencies so as to diminish their effect upon his mental nature, and he must be taught to reason as to the ultimate consequences of his conduct.

The theory of localization of brain function does not throw as much light as we could wish, or lead to much practical benefit in the treatment of cerebral diseases. In treating such diseases we must look upon the brain as a whole, and our medicines must be calculated to act upon it through the general system. Even when we can localize we have to combat disease of the brain by therapeutical measures acting upon the whole of the cerebral structure. Gout and syphilis often give rise to cerebral disturbance of an obscure nature. In the former case a gouty affection of the joints may throw light on the diagnosis; or, if the urine is carefully examined, chemically as well as microscopically, its undue acidity or the presence of uric acid crystals may afford assistance in diagnosis. In the latter case, where the cerebral phenomena are obscure and perplexing, the liberal and continued use of iodide of potassium and protiodide of mercury (the latter in small doses) will often relieve the symptoms and clear up the doubtful diagnosis. I think the effects of constitutional syphilis in the brain often consist in gummatous deposits in the dura mater or in the brain itself, and these melt away under the combined influence of mercury and iodine.* Both the alvine and renal excre-

* Moxon and Broadbent have shown that syphilis attacks the surface of the brain and its membranes. It attacks them in limited spots and it spreads slowly. The morbid changes are, on the one hand, adhesion of the membranes to each other and to the surface of the brain, by means of an exudation which may invade and destroy the gray matter, interfere with the supply of blood, and, when it occupies the membranes at the base of the brain, surrounds and involves the nerves in the intracranial part of their course; or, the syphilitic deposit may take the form of a gummy tumour. The brain or spinal cord may be invaded by gummatous tumors springing from the dura mater, or from bones, or there may be syphilitic disease of the walls of cerebral vessels. When we find syphilomata in

tions should be examined with care in mental disorders. They are rarely found normal as regards quantity and quality. The bowels are constipated or the stools are wanting in bile, although diarrhœa is present. The urine is very seldom in a natural state. It is thick and turbid, of a high specific gravity, and abounds in the salts of urea. In cases of melancholia the urine contains oxalic acid or oxalate of lime crystals. The body is poisoned by the retained nitrogenous material, and we must primarily rid our patients of all such substances. This can be effectually done by administering ten grains of calomel, followed by salines, which prepares the system for other treatment. The administration of nitro-muriatic acid, in water, after meals will speedily rid the nervous system of the poisonous effects of the oxalate of lime if it is found to exist in the urine, and I have seen the most intense depression, bordering on an attack of mania, speedily cured by relieving the oxaluria which had caused this state of melancholia.

The Necessity of Prompt Treatment.—Although it is not generally so regarded, insanity is one of the most curable of serious diseases if promptly cared for and treated. The mistake which is committed every day by foolish friends and relatives of keeping secret as long as possible the fact of the patient's insanity, thereby depriving him of the necessary care and treatment at the outset of the disease, is often fatal to the prospects of recovery of the unfortunate patient, who is only sent to an asylum when he has become perfectly unmanageable and the disease has become deeply seated. It has been stated by eminent authority that if persons who are attacked by this disease were cared for as promptly as if they were suffering from an attack of dysentery or fever, eighty or ninety per cent. could be restored to health and usefulness. There is no disease, however, which develops more rapidly if not treated, and tends to induce organic degeneration, which renders it incurable. From a financial point of view it pays well to restore the insane as soon as possible to usefulness and health, and thereby save the commonwealth the cost entailed by the loss of his labor, and also the amount that has to be paid for his board and clothing, which, at the lowest estimate,

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the brain, they are usually located in the gray matter of the corpora striata and thalami. I have seen convulsions, paralysis, and the most varied intellectual and moral disturbance, from syphilitic disease of the surface gray matter of the brain. We may have syphilitic epilepsy, cerebral disease in infantile syphilis, and syphilitic thrombosis of cerebral arteries. Headache and giddiness are prominent symptoms of cerebral syphilis, with great intellectual dulness and muscular weakness.

amounts to not less than $156 per year, or $3 per week. Dr. Edward Jarvis, of Dorchester, Massachusetts, who has made very laborious investigations upon the subject, in a paper entitleed "The Political Economy of Health," presents the following view of the gain or loss entailed upon the State or family of an insane man by his cure or by his remaining a lunatic for the period of life left to him after his attack. According to Mr. John L. Copeland's table, showing the average longevity of the insane from any given age, it is seen that a man of 20 years of age, if sane, has an average life of 39.48 years, while if insane he has but an average life of 21.31 years if not restored to health. Dr. Jarvis has estimated that, leaving out of sight the ten or twenty per cent. of the insane who are incurable, the average time for restoring to health the insane who apply for treatment upon the early symptoms of disease is twenty-six weeks. At $4 per week, which was the average cost in the three State lunatic asylums in Massachusetts for the past year, this amounts to $104, to which is added $30 for each patient for the cost of rent, or interest on the value of the hospital, etc., for six months, making an average cost of $134 for restoration to health. If not restored to health, the family or State must be at an expense of $156 a year for 21.31 years, and must also lose the patient's earnings for the 39.48 years which he would have made if well. The cost of the patient's support is estimated at $2121, while the loss of his future labor, if he becomes insane at 20 years of age, is estimated at $2665.37, making a total loss of $4786.37 if not cured, while, if cured in the average time of twenty-six weeks, at a cost of $134, there will be a gain to the family or to the State of $4652. The foregoing is an admirable argument for sending insane patients to be treated in the early and curable stage of the disease, and, if acted upon, would reduce by a large percentage the incurable cases which are now to be found in such great numbers.

In ancient times the insane were regarded as possessed with devils, and were accordingly fastened with chains, handcuffs, and fetters, and confined in cages or dungeons to drag out their miserable lives as best they could. In 1689, Johannis Helfrici, in writing on insanity, says: "Severe discipline—chains and stripes—to cure the fury and depress the elation of mind." Formerly the miserable insane were crowded together pell-mell and without any distinction, exasperated by the brutal rudeness of their attendants and subjected to the vain caprices and arbitrary orders of an unfit or negligent superior, and were constantly

in a state of agitation and continually uttering complaints, lamentations, and loud cries, while to-day every patient enjoys the degree of liberty accordant with his personal security and that of others, while, instead of being shut in cells, they are permitted to promenade freely in a spacious and agreeable inclosure, taking the precaution of having attendants employed especially in watching them, while exercise and labor are fundamental rules in treating insanity in our hospitals for the insane.

Curability of Insanity.—As I have just stated, insanity is a curable disease if properly treated, but experience shows that very often the disease has been permitted to become permanently fixed before it is subjected to a curative process, and thus the proportion of incurables received at our asylums has been constantly increasing in the progress of years. The next national census will show that the number of the insane in the United States is nearly twice as large as has generally been supposed; and in the State of Massachusetts, for instance, where the estimated proportional number of the insane has been in years past about one to every thousand of the population, there are known to be nearly three to every thousand. We need, what we are beginning to have, a reformation in the statistics of insanity, so that we can see what the effects of treatment and other circumstances are on the health of patients and in regard to cure. We want to know how many patients recover permanently or for a long period of time, not how often a patient discharged from an asylum as recovered returns to the same asylum to be again discharged as recovered in a few months. A great many cases in our State hospitals for the insane, which are discharged as recovered in the course of any given year, are patients who have previously recovered from earlier attacks, and are relapsing cases, nearly all of whom will probably become again asylum patients. Even among the primary recoveries many will relapse. I think there is no reasonable doubt of the fact that insanity, as it is seen in our public institutions, is far less susceptible of cure than the profession has heretofore been led to believe. All readmissions of patients to asylums should be tabulated by the superintendent, as it is only in this way that accuracy respecting true recoveries can be arrived at. One of the ablest investigators, Dr. Pliny Earle, the Superintendent of the Massachusetts State Lunatic Hospital at Northampton, in his last annual report of that institution, gives the following results in 1879–80, at the Massachusetts State hospitals, which, as relates to

the curability of insanity, has an important bearing, as it shows the very misleading method of reporting recoveries which almost universally prevails in our public institutions:

The adoption last year by all the State hospitals for the insane in Massachusetts of the new series of statistical tables prepared by the Board of Health, Lunacy, and Charity, has given us an advantage never before enjoyed. It has enabled us to show very nearly, if not positively, just what was done by those institutions in the course of the official year 1879–80 towards the restoration of the insane and the diminution of their number within the Commonwealth.

At the four State hospitals, at Worcester, Taunton, Northampton, and Danvers, in the course of the year ending with September 30, 1880, the number of persons admitted was 1092,—*persons*, or individuals, be it understood, because it not infrequently happens that one and the same person is admitted more than once in the course of a year. Out of this number of persons, and those who were in the said hospitals at the beginning of the year, the number of persons discharged recovered was 283. This makes the recoveries, calculated on the admissions—the method which approximates most nearly the truth—equal to 25.91 per cent., or a small fraction more than one-fourth of the whole.

Such, then, are the results for one year at our curative State establishments. I have here stated them in the way that similar results have always, prior to the year 1880, been reported at the institutions for the insane throughout the United States. Even as so reported, giving to them all the advantage derived from a broad general statement, with no examination into the detail of modifying facts and conditions, they yield no evidence of a great degree of curability of the insane. The curable *three-fourths* of former faith dwindles very nearly to *one-fourth* in absolute practice.

The hospital at Danvers, the newest of the four institutions mentioned, and situated nearest the populous centres of the State, received nearly all of the recent cases from Boston during the past year. It probably also received all which were committed from Lynn, Salem, Lowell, and Lawrence. But as that hospital has been only a short time in operation, I disregard it in the showing that I am now about to make, and take the three other hospitals, which have been in operation different periods, varying from twenty-three to forty-eight years.

Those three older hospitals, at Worcester, Taunton, and Northampton, admitted during the official year 1879–80, 521 persons. They discharged recovered 118 persons, making a percentage of recoveries of 22.64, a noteworthy fraction less than one-fourth of the number admitted.

But let us look a little farther. The three hospitals *discharged* 118 persons recovered; but they *admitted* 55 persons whom they had *previously* discharged recovered. Consequently the actual gain, in the course of the year, of recovered persons in the community was only 118 minus 55, which is 63. This is only 12.09 per cent., or less than one-eighth of the number of persons admitted. It is an average of 21 gained recoveries at each of three large hospitals, the average number of the patients of which was, for the year, equal to 503 for each.

A fact yet unmentioned gives, at first view, a still more discouraging aspect to the case. The 55 persons readmitted after previous recovery had been discharged recovered, not alone once each, making 55 recoveries, but a total of 115 times. The public had been told in the reports of 115 recoveries of those 55 persons. Hence, if *recoveries*, and not *persons*, be considered, the three hospitals issued 118; but they took back 115

which had been previously issued, leaving in the general population a gain of only three, or an average of one for each hospital.

It is not improbable, however, that the excess of *recoveries* (115) over that of persons (55) readmitted was counterbalanced by a similar excess of *recoveries* over that of *persons* (118) discharged. For example, if one of the 55 persons readmitted had previously been discharged recovered five times, there may have been, among the 118 discharged recovered, one who had previously been discharged recovered an equal number of times.

The statistics just given in aggregate for the three institutions were specifically, for each one of them, as follows :

At the Worcester Hospital, the oldest of the three, although its present building is the newest, the number of persons admitted was 222. The number discharged recovered was 41, which is 18.46 per cent., or less than one-fifth of the admissions. But among the admissions were 25 persons whom it had previously discharged recovered. Hence the actual gain of recovered persons outside of the hospital was only (41 minus 25) 16, or 7.2 per cent. of the number admitted.

The 25 persons readmitted had been discharged recovered a total of 58 times.

At the Taunton Hospital, 184 persons were admitted and 49 discharged recovered, a percentage of 26.62. Of those admitted, 19 had previously been discharged recovered, so that the gain of recovered persons in the general population was only (49 minus 19) 30, or 16.3 per cent. of the admissions.

The 19 persons readmitted had been discharged recovered 35 times.

At the Northampton Hospital, the number admitted was 115. The number discharged recovered was 28, equal to 25.22 per cent. But of the persons admitted there were 11 who had previously been discharged recovered. The gain of recovered persons in the community was, therefore, only (28 minus 11) 17, or 14.78 per cent. of the number admitted.

The 11 persons readmitted had been discharged recovered a total of 22 times.

It is believed that from this exposition it will be apparent that the method still almost universally prevalent of reporting recoveries is, except in a technical or medical sense, very fallacious and deceptive; and that, until some other method, similar to the new one in Massachusetts, be adopted, those statistics will be worth next to nothing in the study of the problems of social scienee.

At the Danvers Hospital, the number of persons admitted in the official year was 571. The number discharged recovered was 165, or 28.89 per cent.

The proportion of recent cases received at that institution was unquestionably, and for obvious reasons, larger than at either of the other three.

That hospital had been in operation less than eighteen months at the beginning of the official year in question; hence it could not be expected that, among the persons admitted, there should be many who had previously been discharged from it recovered. And yet there were some such readmissions the report does not state how many; but it was of so many persons that their total of recoveries was 18.

A Glance at Great Britain.—Having shown the results at the State hospitals of Massachusetts, perhaps it may be permitted to extend our observation to some of the similar institutions abroad, for the purpose of further illustrating the subject, as well as showing the advantages of our recently adopted method of reporting recoveries.

At the British asylums the method of reporting the statistics has always been essentially the same as it is in the United States. We, indeed, followed their example. But it has heretofore been my impression that the proportion of patients readmitted, after having been discharged recovered, was much smaller there than in this country. I have supposed that the British patients remained longer in the hospitals than do the Amer-

ican, and that thus their recoveries were so confirmed that relapses, or subsequent attacks, were comparatively infrequent. From information recently received, I infer that, at least to a certain extent, I was mistaken, and that there is no very great difference in these respects between the two countries.

Dr. Clouston, of the Royal Edinburgh (Morningside) Asylum, in his report for 1880, has introduced tables by which the same light is thrown upon his statistics of recoveries as upon those of the Massachusetts institutions by the new and recently-adopted method of reporting, with the exception that he does not clearly discriminate between *cases* (or *patients*) and *persons*.

The admissions at Morningside, in 1880, were 347. Of these *patients*, the number suffering from the

First attack of the disease was	231
Second attack,	58
Third attack,	24
Had had several attacks,	26
Congenital,	8

Hence it appears that, of the 347, no less than 108 (58 plus 24 plus 26), or nearly one-third of the whole, were readmitted after recovery from one or more former attacks.

On the supposition that the word "several" means *three* (it probably, as used above, means more), those 108 patients had already been discharged "recovered" a total of 184 times.

So much for the patients admitted.

The number of patients *discharged* recovered, was 165, which is 47.55 per cent., as calculated on the admissions. Of these 165, there were who

Recovered for the first time,	97
Had recovered in former years,	63
Recovered more than once in 1880,	5
Total,	165

At the close of the year no less than nine (9) of these had already been brought back to the asylum, and still remained there or had been removed *unrecovered*.

If the figures in these two tables represent *persons*, we derive from them the following result:

The asylum discharged recovered, 165; but it took back, of persons who had formerly been discharged recovered, 108. Consequently the actual gain of recovered persons in the general population was only 57 (165 minus 108). This is only 16.42 per cent. of the admissions.

The movement of the population at the Morningside Asylum is very rapid. Many of the patients apparently remain in the institution but a comparatively short time. For these reasons it is believed that the proportion of patients returning to it after having been discharged recovered is larger than at most of the British asylums.

In his report for 1880 of the Derbyshire (England) County Lunatic Asylum, Dr. J. Murray Lindsay states that in 20 per cent. of the admissions "there had been previous attacks of insanity." At the Richmond District Asylum, Dublin, Ireland, in 1880, the admissions were 420, of which 65, or 15.47 per cent., were "relapsed cases." The number dis-

charged recovered was 167; but the gain of recovered persons in the general population was only 102 (167 minus 65).

The British Medico-Psychological Association.—The most striking evidence of progressive thought relative to the general subject under consideration is the fact that, at the annual meeting of the British Medico-Psychological Association, which was held in London in August last, the statistical committee of that society recommended for adoption some new tables, as well as alterations in some of those already in use, so modifying the series, as a whole, that the statistics of the asylums can be reported with essentially the same detail and the same perspicuity in regard to recoveries as is found in the new tables of the institutions in Massachusetts.

After a brief discussion, it was decided to postpone for one year the question of their adoption, for the purpose of giving the members an opportunity to study them and to discuss their merits at the quarterly meetings. But there can hardly be a doubt as to the result. The proposed alterations will be adopted. In the present state of things—when, in consequence of the existence of various organizations for the promotion of the objects of social science, the call, outside of the profession, for information in regard to insanity is tenfold greater than it was forty years ago—the members of the British Association cannot afford to refuse to display their statistics in such manner as will render them valuable to the members of those organizations. The present *technical* truthfulness of those statistics must be expanded into an *absolute* truthfulness in regard to the relation between the disease and individuals, or the most important part of the statistics themselves will soon become entirely, as they even now are essentially, valueless. Dr. Clouston is not going to recede from the position gained by the step in advance taken at the time of making the report just passed under review,—a position in which he could show not alone what his institution had accomplished during the year in relation to *disease*, but also to what extent its beneficial influence had affected his *fellow-men*. There are many others among his colleagues in the specialty in England and Scotland who are even now ready to follow his example. The rest will doubtless mostly be ready at the expiration of the appointed year. Let them remember that, no less than forty years ago, a reformation in the statistics of insanity was called for by an Englishman whose keen and comprehensive intellect and whose soundness of judgment were second to those of no one of his countrymen who have written upon the subject: I allude to the late Samuel Tuke. In the thoughtful and excellent article used as an introduction to his translation of Dr. Maximilian Jacobi's treatise on the construction and management of institutions for the insane, he wrote as follows:

"The whole subject of the mode of reporting the results of our institutions for the insane calls loudly for attention, if we would arrive at any useful statistical comparisons as to the effect of treatment and other circumstances on the health of the patients and in regard to the cure of this greatest of all human maladies. The subject would not be unworthy of a special consultation amongst the professional men who are devoted to this department of the medical art."

It appears to me, from the very wording of this extract, that its author had in view the specific changes—perhaps with others—which it is intended to accomplish by the adoption of the proposition now before the Medico-Psychological Association. Shall his suggestions be permitted to lie under the dust and ashes of a half century before they are carried into effect?

Old but Valuable German Statistics.—At the Siegburg Asylum, in Rhenish Prussia, an institution which at that time was under the superintendence of Dr. Maximilian Jacobi, the statistics of recoveries from January 1st, 1825, to December 31st, 1845, a period of twenty-one years, were as follows:

	Men.	Women.	Total.
Whole number recovered,	377	284	661
Living at the end of the period, and have had no relapse,	169	153	322
Relapsed and recovered again at the asylum,	79	48	127
Relapsed and not yet cured,	5	6	11
Relapsed and become incurable,	34	30	64
Relapsed and died insane,	39	18	57
Died without a relapse,	43	25	68
Not heard from,	8	4	12

The number of patients admitted in the course of the period is not given, and, consequently, the percentage of recoveries cannot be obtained. The statistics are valuable chiefly for the purpose of ascertaining to what extent the recoveries were permanent.

At the time of the close of the twenty-one years, 259 of the 661 persons had "relapsed," or, as it is generally stated in this country, had had a second attack. This is equivalent to 39.1 per cent., or a slight fraction less than two-fifths of the whole. But these are not *final* results. Within the *ten years next following the close of the period* the number of relapses would be large, especially among the patients who recovered in the last half of the period. If about *two*-fifths of the whole relapsed *within* the period, it appears, perhaps, more than probable that *one*-fifth (or half as many more) would relapse *afterwards*. Supposing this estimate to be accurate, the whole number of persons relapsed would be equal to three-fifths of the whole number of persons recovered. This corresponds with Dr. Thurnam's well-known formula, derived from his investigation of the subsequent history of patients recovered at the York Retreat.

In regard to the proportion of the persons recovered who would ultimately die insane, it will be perceived that, at the close of the period, it was still too early to furnish the data for a very accurate estimate. Something, however, in that direction may be done. Already the number who had relapsed and died insane was 57. The number who had relapsed and become incurable, and who would consequently die insane, was 64. This gives a total of 121, or a little less than *one*-fifth of the whole, whose deaths, while insane, were assured. According to the above-mentioned formula, *two*-fifths of the whole should die insane. Hence we must find a little over *one*-fifth, or, in actual numbers, 143 *more* who would die insane. These must be looked for (1) in the 322 who had not relapsed, but many of whom undoubtedly would relapse; (2) in the 127 who had relapsed and recovered again, and, judging by what we know in regard to the liability to repeated relapses, a very large proportion of whom would relapse again; and (3) in the 11 who had relapsed and were not yet cured. Of these 460 persons it would not be surprising if 143 should die insane.

An Echo from the Antipodes.—There are two lunatic asylums in South Australia. They are under the general supervision of a board of visitors, of which Dr. Alexander S. Paterson is chairman. The report for 1880 of this board, signed by the chairman as colonial surgeon, is before me. It deals with the subject of recoveries with a commendable extent of detail, although it fails to discriminate between *persons* and *cases*, and to give the number of attacks and of recoveries of those patients who have been readmitted after recovery.

At the two asylums, Adelaide and Parkside, the aggregate number of admissions in 1880 was 223. The number of patients discharged recovered was 90, which is equal to 40.35 per cent. But of the patients admitted there were 35 who had previously been discharged recovered. The two institutions gave to the people 90 recoveries, but they received back from the people 35 former recoveries. Therefore the gain of recoveries among the people was (90 minus 35) only 55. This is 24.66 per cent. of the admissions.

Five of the patients readmitted returned to the hospital within a month from the time at which they were discharged recovered.

As might be expected in a country so recently settled as South Australia, a large proportion of the recoveries were from cases originating in intemperance. In no less than 25 cases of males the form is called *alcoholismus*. The patients recovered in 24 of them. Eight of these were in the asylum less than a month each, and the average time of treatment of the 24 was only one month and seven days.

Athenian Success.—I now approach a "study" from the consideration of which I would gladly be released; but, in the discussion of this subject, it is proper that all fallacies should be exposed, and all sources of error pointed out. Furthermore, I have been criticised for the assertion, in the pamphlet on the *Curability of Insanity*, that the medical officers of institutions for the insane are men "with like passions as other men," and, therefore, the introduction here of any evidence that sustains the truth of the assertion is more than justifiable.

That the reader may enter more intelligently upon the matter, it may be remarked that, in Ohio, the superintendents of the State institutions for the insane are among those persons whose offices are the "spoils" which belong to the victors in politics. The mere statement of this fact is sufficient for the present purpose. Any attempt to present in detail the evils consequent upon such a state of things would be irrelevant.

In his report for 1880 of the State Asylum for the Insane at Athens, Ohio, Dr. H. C. Rutter, who had but recently been appointed to the office of superintendent, mentions the discussion of the curability of insanity begun in the reports of this hospital, and, after stating that it has been taken up by alienists all over the world, gives the following confirmatory evidence of the truth of one of my "conclusions:"

"It has frequently happened that the same person has been discharged more than once during one year, and that each discharge has been reported as a separate cure. One person in Ohio is reported to have recovered seven times in one year, and, while he figured in the annual report as seven 'recoveries,' was actually a patient in one of the wards at the time the report was made out."

After some further remarks, he proceeds as follows:

"It has also been charged that these 'cures' are flexible, and can be increased by the superintendent whenever occasion arises to prove his superior fitness and qualifications as a specialist. This charge has been made repeatedly, and by many distinguished members of the profession, who have been disgusted with the idle talk about cures made by political superintendents for the purpose of gaining cheap notoriety through the secular press. We have, perhaps, felt this in Ohio to a greater extent than in almost any other State in the Union. To show that these charges are not made without some foundation, and that some reason for the demand that is being pressed for a reform in our asylum statistics does exist, I will quote some interesting cures from the general register of this asylum.

"During the two years previous to May 20th, 1880, we find among the 'cures' the following remarkable cases. I quote from the male register, and presume the female register shows an equal proportion of remarkable cures:

	Cures.
"Duration of insanity over 50 years,	1
" " " 20 "	6
" " " 18 "	3
" " " 15 "	3
" " " 12 "	3
" " " 6 "	16
Total over six years,	32"

Thus in the course of two years, and from the men's department alone, thirty-two cases were discharged as recovered, in no one of which had the disease existed less than six years. In one it had existed fifty years, and the average duration for the whole was more than twelve years. "Four of these," continues the doctor, "were cases of chronic dementia; four were epileptic, with duration of insanity ranging from seven years to twenty-one years."

No man who has had any considerable experience in a hospital for the insane can fail to instantly perceive the preposterous absurdity of such statistics as these. By a probably low estimate there are now in the public institutions of Massachusetts not less than fifteen hundred insane persons who might be set at liberty and reported as "cured" or "recovered" with as much propriety as were those thirty-two patients at the Athens Asylum. But by those thirty-two cases—together, undoubtedly, with similar ones from the female department—the superintendent increased the proportion of his "cures" to 63.50 per cent.

I am still of the opinion that "the medical officers of institutions for the insane can claim no exemption from the common weaknesses of human nature;" that "they are men with like passions as other men," and that the degree of confidence which is to be placed in their statistics depends, to a large extent, upon the temperament and character of the individual from whom they come.

Other statistics are as follows, at hospitals for the insane who base their calculations on cases discharged:

Statistics of Utica, N. Y., Asylum.—The Fortieth Annual Report of the New York State Lunatic Asylum, at Utica, which, owing to the politeness of Superintendent Dr. John P. Gray, I have before me, shows that during the year 1882 there were treated 1038 cases—508 men and 530 women. The number at the commencement of the year was 626. Received from September 30th, 1881, to September 30th, 1882, 412 cases. The daily average under treatment was 621. There were discharged, recovered, 109 cases; improved, 46 cases; unimproved, 235 cases; not insane, 13 cases; died, 57. The *thirteen cases* were not insane when admitted. Dr. Gray has some excellent remarks upon early treatment, which we insert as follows:

Dr. Gray deprecates the remarks of Dr. Pliny Earle, showing that insanity is not so curable as was formerly supposed, and says, "he takes the results growing out of the public policy of indifference and neglect, instead of basing his calculations upon what a wise and humane policy could effect," etc. Dr. Gray thinks the apparent increase of insanity in New York State is due to accumulation. He has also some wise remarks relative to the premature removal of patients from asylums. His remarks on the necessity of statutes making provision permitting persons to be voluntary applicants for admission to asylums, are worthy of remark. We certainly need such statutes.

A man who feels his brain out of order is just as much entitled to be a voluntary applicant as a man with a broken limb.

Dr. Gray says:

Importance of Early Treatment.—I deem it proper to say that a greater proportion than in any previous year of the cases admitted belong under the head of chronic insanity. In my last annual report statistics were presented showing the percentage of patients, for each year, for the ten previous years, who had been insane a year or more before admission. I continue this table, as it not only shows how large a proportion are practically chronic cases when admitted, and that the evil practice of delay is increasing:

Year.	Whole number admitted.	Found not Insane.	Number Insane One Year and over.	Percentage Insane One Year and over.
1871, ...	516	13	212	42.14
1872, ...	399	17	143	37.43
1873, ...	410	13	142	35.76
1874, ...	368	6	117	32.32
1875, ...	432	15	136	32.61
1876, ...	436	8	138	32.24
1877, ...	460	13	149	33.33
1878, ...	427	10	125	29.97
1879, ...	418	16	135	35.58
1880, ...	468	11	177	38.73
1881, ...	411	8	190	47.14
1882, ...	412	13	190	47.61
	5,157	143	1,854	36.97

As of further and important interest in this connection the following table has been prepared, to show how wide a difference exists between the recoveries in recent cases and n those not placed under treatment until the disease was fully established:

TABLE

*Showing a comparison, for ten years, between the percentage of recoveries on the annual admissions; the percentage of recoveries of those who had been insane one year and more; the percentage of recoveries of those insane less than one year, and the percentage of recoveries of those insane six months or less.**

Year.	Number of insane admitted.	Number discharged recovered.	Percentage of recoveries.	Number admitted—insane one year and over.	Number recovered who had been insane one year and over.	Percentage of recoveries.	Number admitted—insane less than one year.	Number recovered who had been insane less than one year.	Percentage of recoveries.	Number admitted—insane six months or less.	Number recovered who had been insane six months or less,	Percentage of recoveries.
1873, ...	397	122	30.73	142	20	14.08	255	102	40.00	210	87	41.42
1874, ...	362	123	33.97	117	14	11.96	245	109	44.48	221	99	44.79
1875, ...	417	132	31.65	136	21	15.44	281	111	39.50	250	104	41.60
1876, ...	428	142	33.17	138	20	14.49	290	122	42.06	249	107	42.97
1877, ...	447	148	33.10	149	22	14.76	298	126	42.28	263	119	45.24
1878, ...	417	144	34.53	125	18	14.40	292	126	43.15	253	116	45.84
1879, ...	402	141	35.07	135	11	8.14	267	130	48.68	226	118	52.21
1880, ...	457	155	33.92	177	22	12.42	280	133	47.50	238	122	51.26
1881, ...	403	128	31.76	190	25	13.15	213	103	48.35	185	91	49.18
1882, ...	399	109	27.32	190	12	6.31	209	97	46.41	187	87	46.52
	4,129	1,344	32.55	1,499	185	12.34	2,630	1,159	44.06	2,282	1,050	46.01

* In this table those admitted and subsequently found not insane are deducted from the annual admissions. Their number for each year will be found enumerated in the preceding table.

It will be seen from the above table that the average percentage of recoveries on the admissions for the past ten years is 32.55, while the percentage of recoveries of those who were retained at home without treatment until their insanity had continued a year or longer is only 12.34.

To exhibit more clearly the importance of early treatment, a computation of the recoveries of those admitted during the same period who had been insane less than a year, shows the percentage of recoveries increased over the general average of 32.55 to 44.06, and the percentage of recoveries of those brought within six months of the attack rises to 46.01.

It will be observed that out of the 4129 insane admitted during the last ten years 1499 were not brought to the asylum until after their insanity had lasted a year or more. If they had been brought within a year of the beginning of the attack, instead of a percentage of recovery of 12.34 it would have been 44.06, amounting to 475 more persons cured.

To say nothing of the individual and family sorrow entailed by such neglect, the subject possesses an economic aspect which demands consideration. At a low estimate the individual expectation of life of those 475 cases is 15 years. Estimating the average yearly cost for their support at $150, the expense to the public or their friends would reach the sum of $1,068,750.

These figures, far more forcibly than words, show the evils of delay in placing the insane under treatment, and I am forced to the conclusion, from experience and observation, that the unjust crusade against asylums is largely responsible for this wrong inflicted on the insane, and for the increase of chronic insane with the public and private burdens it imposes.

Bearing in mind what has already been stated, that the tendency to delay has recently been growing instead of decreasing, for the tables show that for the past two years the percentage of chronic cases admitted has risen from an average of 34.08 to over 47 per cent., the outlook for the insane and for those upon whom their support will fall is not encouraging.

Dr. Gray's remarks on restraint and seclusion are based on the broad grounds of the welfare of the patient and his care and speedy cure, and are given as follows, as his wide experience entitles such remarks to be attentively considered. His interesting remarks on the *Commitment*, *Detention*, and *Discharge* of patients are also given in the few following pages, and will repay careful reading:

Restraint and Seclusion.—Two years ago, I submitted to the board of managers, in compliance with their request, as an appendix to my annual report, a paper on the custody and treatment of the insane, which included a full presentation of the status of professional opinion at that time on the question of mechanical restraint, with an analysis of the recent discussions on the subject held at meetings of the medico-psychological societies of Germany and France, whose members are principally superintendents of institutions for the insane. In these discussions both sides of the question were thoroughly explored, and the verdict to which the evidence led was simply that restraint is not to be used for its own sake or for the mere convenience of officers and attendants, but as the interests of the patient alone required, to facilitate his proper treatment and recovery; that the minimum of restraint consistent with the welfare of the patient and the safety of those around him should be aimed at, and that the nature of the restraint required in

each particular case, whether by camisole, seclusion, padded rooms, shower baths and packing, dry or wet, must be determined, like the prescription of therapeutic remedies, solely by the judgment of the medical officers who were responsible for all branches of treatment. All the participants in the discussion allowed—even those who proclaimed themselves to be the warmest advocates of non-restraint—exceptional cases which cover the whole ground of the principle under discussion, and in fact narrow down the whole debate to the simple question whether seclusion or solitary confinement, with hands and limbs in free and violent motion to do what the patient may be driven to do by his disease, or forcible restraint by the hands of attendants, is better than the open association and intercourse with other patients and liberty to move about the wards, only with hands rendered incapable of doing harm by some mechanical means. This is a question which experience alone can determine, and I have no hesitation in declaring that experience by all means favors society as against seclusion in such cases.

It was shown in this same paper that the so-called 'abolition of restraint' in the English asylums must not be understood in an absolute sense; for whatever theory or line of practice has been adopted, we find there are still cases which require 'strong dresses,' 'endless sleeves,' 'camisoles,' 'tied hands,'' 'forcible holding by attendants,' 'wet or dry packing,' or 'seclusion in dark or padded rooms,' and the reasons generally given for any of these forms of restraint are for 'surgical purposes,' or 'violence and destructiveness,' or 'picking the face,' or 'to prevent suicide,' or 'self-injury and mutilation,' or 'persistent destructiveness,' or 'self-denuding,' etc. I summed up that paper with the following conclusions, which I wish here to reiterate, as what every passing year's experience has only served to confirm and corroborate.

"It would seem that the English superintendents and the commissioners have the same exceptional classes to deal with, and that they find in practice some mode of protective restraint must be resorted to. Their variations of practice would indicate that, instead of a settled conviction of the benefit of some particular method, they were disposed rather by a variety of means to apply whatever might be the best to accomplish the desired object of necessary protective control with the least discomfort and risk to the patient. We are obliged to take it for granted that those who have figured as advocates of non-restraint do not really mean the abandonment of all coercive measures, for, after all, seclusion against the will of the patient, or the use of padded rooms, wet and dry packing, showering and manual force of attendants, can be regarded in no other light than as restraint.

"I think it must be admitted from the foregoing that there is no real difference in principle among experienced professional men who have devoted their lives to this branch of science applied to the practical ends of humanity and benevolence. Compared with the manner in which the insane were treated in former times, the present system is indeed one of 'non-restraint.' Intelligent medication, exercise in the fresh air, good and abundant food, moderate and pleasant amusements, congenial occupation as far as practicable, combined with comfortable surroundings, have proved a sufficient treatment for the greater proportion of the insane, so far, at least, as to make the necessity of forcible means and mechanical appliances the 'exception to the rule.' But as these exceptional cases do exist, on the universal confession, and always will, they require exceptional treatment. How their best and most humane care can be accomplished is the serious problem that brings itself to every conscientious mind. The principles on which all must agree are simply these: the guiding object should be the welfare of the patient (not forgetting also the safety of those about him), his care and cure in the surest and speediest manner possible. The responsibility of all measures to these ends must rest upon medical decision and judgment alone; whether control over extreme violence,

manifesting itself suicidally or homicidally, shall be established by the simplest mechanical restraint, or by drugs, or by the application of water in shower-baths, or by wet packing, or by the hands of attendants, with all the risks of personal struggles, or by seclusion in rooms with or without clothing or bedding, with the risk of self-injury by such means as still remain to the patient, or by any other measures known to science and experience, must all depend ultimately upon what the medical man on the whole shall deem best for the patient. All this must come under the one head of medical care and treatment, precisely as is the case with the physicians in general practice in the treatment of other diseases, or the treatment of any disease in any ordinary hospital, with this difference, perhaps, that whatever the physician in the case of the insane in hospitals advises, he is expected to see carried out. Wherever the question of restraint arises in connection with any individual case among his patients, he must judge of the nature and extent of that restraint, and he must be presumed to know and be able to judge between what is cruel and what is humane, protective, and curative, as well as the surgeon knows and judges in his operations between necessary pain and useless barbarity."

In view of the continued agitation of this subject, I have only the following considerations to add: Nobody disputes that mechanical restraint *could be* wholly abandoned. So could the administration of medicine be wholly discontinued. There may be those who are prepared to take this extravagant ground in regard to both; but the real question, at least among experienced men, is whether restraint *should* be abandoned; whether such a course would be best for the insane. It is upon this test our practice must depend, whether in itself the practice be agreeable or disagreeable. I stated in my annual report more than twenty years ago (1860), before most of the agitators of the present day came upon the stage, that restraint and seclusion were in themselves inadmissible, and only to be used as a necessary and indispensable means of treatment. There is abundance of experience on record in regard to this subject. The discussion of restraint on its merits has long since been so exhausted as to render all that can now be said mere repetition and altogether inadequate as a means of new notoriety. The conclusions of the Association of American Superintendents, of the Psychological Society of Paris, and the German and English authorities who represent experience with the insane, have settled every principle in this matter, *and left only the discretion of reducing the minimum to nothing*. But the fact is restraint has *never* been wholly abandoned either in England or any other country. The most that can be said is that certain persons say they do not use it. Their real practice is open to the inquiry whether their substitutes are better for the patient or worse. The practice of not using a remedy which all admit to be only for exceptional cases may conform to a dogma by a physician more than it contributes to the comfort or recovery of a patient, which latter are liable sometimes to be lost sight of in the ardor of defending a theory.* I have heard some say they would not under any circumstances prescribe chloral, and others say the same of alcoholic stimulants. Such utterances may be honest. It does not, however, follow that they are wise. They do not make their

* NOTE.—Dr. Tuke, in the "History of the Insane," etc., already referred to in the account of Broadmoor Asylum, says there is no mechanical restraint resorted to, but adds, "some patients are, of course, secluded in a single room in which a bed made on the floor is the only furniture allowed, and in which the window is protected by a shutter if the patient breaks glass. The room is, when the shutter is closed, only partially dark, as there are two small windows near the ceiling out of the patient's reach. By the side of the door is an inspection plate, or narrow slit in the wall, with a movable glazed frame, opening outwards, through which the occupant of the room can be observed when necessary."

authors safe guides. Evils are said to grow out of the medical use of many remedies. The use and recognition of opium by medical science as a valuable remedy in certain cases to relieve pain, to secure sleep, etc., gives it an indorsement which does not, however, warrant its indiscriminate use. Persons may use it, even medically, when it should not be resorted to, but even this is no argument against its proper use in the hands of the experienced for the relief of human suffering. So of any other remedies, such as the bromides, very common remedies liable to abuse. Their safe administration is looked for only at the hands of experienced and conscientious men. The question is, why should not this same principle govern the use or non-use of mechanical restraint in the treatment of the disease, insanity? We are not advocates of restraint any more than we are advocates of cutting off limbs. Neither is to be resorted to, except as medical treatment.

Commitment, Detention, and Discharge of Patients.—When abroad, in 1879, I gave special attention to the questions of commitment, detention, and discharge of patients; also to the general management, internal and otherwise, of hospitals for the insane, privileges granted, occupation, treatment, etc. I had the honor and good fortune to meet some of the Commissioners in Lunacy, and among them the distinguished chairman, the Right Honorable the Earl of Shaftesbury; also some of the most prominent present and Ex-Chancery Visitors in Lunacy, and many of the medical superintendents. From these gentlemen, as well as from personal observation, I was able to obtain knowledge of the law and practice obtaining, and of the government, general and internal, of hospitals for the insane. I was strongly impressed with the close resemblance of the law and practice to the State of New York in regard to the admission and discharge of patients, the guarantees, however, being greater in New York than in Great Britain, especially in respect of medical certificates and official magisterial interference. The New York law and practice in respect of discharge are also much simpler in regard to both private and public patients. In the appendix of my report for 1878 I presented the resemblances and differences in these and other respects between the English Lunacy Statutes and those of New York.

I beg to present here the opinions on the English and Scotch laws, in their practical application, on the most important matters which concern the insane, which were given before a Parliamentary Commission of 1877, under a resolution of Parliament ordering 'that a select committee be appointed to inquire into the operation of the lunacy law, so far as regards the security afforded by it against violations of personal liberty.'

I might have summarized the matter and thus brought it into briefer space, but it seemed best, as far as possible, to give the exact language used. I have drawn from the testimony of men of large experience and great distinction in connection with the care of the insane and managment of hospitals, as well as from the testimony of officials exercising governmental supervision, and it is an interesting and significant fact that the opinions expressed before that commission by the distinguished medical men called before it, were fully indorsed by Lord Shaftesbury, a man of such vast experience and such illustrious name in the annals of philanthropy in connection with the care of the insane. The unanimous opinion of the law held by such men on all vital points covering the care of the insane, and indorsed by such an authority as Lord Shaftesbury, should be conclusive of its wisdom and practicability.

The English law in regard to medical certificates is much simpler and much less guarded than that of the State of New York. Two medical certificates are required in cases of private patients, and but one in the case of paupers, and no medical certificates in the case of chancery patients. All the qualification required is that the medical men 'shall be registered physicians or apothecaries.' They are not required to be approved

by any judicial or other authority. In New York the law requires in all cases, private or public, two medical certificates, and these must be made under oath by medical men, authorized as examiners, and the certificates must be approved in writing by a judge.

Mr. Perceval, Secretary of the Lunacy Commissioners, on his examination before the Parliamentary Committee of 1877, testified, in answer to the question, 'Is it necessary that the two medical men who sign the certificates should be qualified practitioners?' that up to 1858 there were no qualifications specified; that patients could be sent by a physician, apothecary, or surgeon; that the medical act of 1858 provided for the registration of all medical practitioners, and when the lunacy acts were last amended, in 1862, advantage was taken of that circumstance to get a proper definition of the words 'physician, apothecary, or surgeon.' These words throughout the lunacy acts now mean medical practitioners registered under the Act of 1858, and no other person can sign a certificate.

"Q. He may be a physician, surgeon, or apothecary?

"A. He may be a physician, surgeon, or apothecary. We do not care what he is, so long as he is a registered medical practitioner. He has such a qualification as entitles him to be on the register, and that is sufficient.

"The English law provides that the medical man must have seen a patient within seven days before admission; copies of the certificates are sent to the Commissioners in Lunacy within twenty-four hours after the admission of the patient, and any defects may be remedied within fourteen days after being issued, and the certificates must always be in form. The New York law provides that the certificates must be in form as required by the Commissioners in Lunacy, and must be completed and approved by the court within five days.

"Mr. Perceval testified in regard to private patients that two medical certificates and a request, or order, by some friend or acquaintance, are all that is required; in regard to public patients an order of the magistrate accompanied by one certificate. To the question whether the certificates should not be countersigned by some public officer, he answered: 'I do not think there would be any additional protection to the patient at all; but there are of course two sides to every question, and you would interpose an additional difficulty, no doubt, if that is your object, upon that which is hard enough already.'

"Q. I wish to know whether you do not think there should be some public officer, or some public record of the incarceration of people against their will?

"A. You have a public record, and I do not personally think that the intervention of a public officer would be of any material value at all to the liberty of the subject. It would certainly not be a material guaranty, and it would oppose an additional difficulty to the earlier treatment of insanity, which is so very important.

"Q. Are there different forms of insanity, some of which may be aggravated by early treatment, and others cured?

"A. That is a medical question which I leave, if you will allow me, to the medical witnesses."

"*Mr. James Wilkes*, one of the Commissioners of Lunacy, in answer to the question: 'Do you think the protections which the law at present provides against the detention of persons who are not lunatics are quite sufficient to protect the interests and person of the subject?' replied: 'I think they are; I must say that if I myself were to be insane, or had any one belonging to me afflicted in that way, I should place perfect reliance in the present safeguards which the certificates and orders provide?

"Q. Do you regard the medical certificate as in itself a personal protection to liberty?

"A. Of course it would not be, apart from the order and statement, but it is a most

important thing in deciding on the insanity or not of a patient, and as to the propriety of placing that patient under care and treatment.

"Q. Do you think the precautions which the law at present provides sufficient?

"A. Yes, sir.

"Q. The certificate now is permanent, lasting until the patient is discharged; do you think that is a good thing, or that the certificate ought to be for a limited time and renewable?

"A. I do not think there is any necessity for renewing it. Many of the patients in licensed houses are very poor; they are received and kept really at rates which are little above pauper rates, and any additional certificate would be a tax upon the friends, for I presume it would fall on the friends, and I really do not know what good it would do.

"Q. I understood you to say that you think it desirable in all cases that they should be very early treated?

"A. I think so.

"Q. You make no exception?

"A. No, sir. There may be an exception as to the period; it depends upon what is called early treatment. There might be some very slight insanity, a first attack, which gets well very rapidly, perhaps before any one would think of removing a patient to an asylum.

"Q. You think there are no cases of a very excitable temperament, in which, being sent to those places, might increase the complaint and tendency to mania?

"A. No, sir; I do not think so. I think the removal from home associations and from the exciting causes of the disease, tends very rapidly to the recovery of the patient."

Dr. J. Lockhart Robertson, one of the Lord Chancellor's visitors in lunacy, and previously a medical superintendent, was examined. To the question as to qualifications of the physician, he replied: "I do not think a special knowledge of lunacy is so important as being a well-educated physician.

"Q. Are you of the opinion that the present mode, by the certificate of two medical men, surgeons for instance, or apothecaries, is a sufficient safeguard to the liberty of the subject.

"A. I think it is. I think the difficulty is to get the certificates. I think medical men are so afraid of actions that the great difficulty is to get the certificates signed. In an urgent case early treatment is, of course, of great importance to the patient.

"Q. You are decidedly of the opinion that the safeguards against the improper admission and detention of persons in asylums, hospitals, and licensed houses are practically sufficient, and that a more complicated system of checks would do more harm than good?

"A. Yes, decidedly."

Dr. Robertson expressed the opinion that it might be desirable to have some official order by a magistrate in cases of private patients. This would give protection to the friends as well as the physicians making the certificates.

Dr. J. Crichton-Browne, Lord Chancellor's visitor in lunacy, and previously a medical superintendent, was examined.

"Q. I will ask you the same question that I asked Dr. Robertson. Are you decidedly of the opinion that the safeguards against improper admission and detention of persons in asylums are practically sufficient, and that a more complicated system of checks would do more harm than good?

"A. I am.

"Q. That is an opinion based on your experience in your official capacity, and also on your previous experience?

"A. It is.

"Q. I do not know whether you concur with Dr. Robertson in the opinion that the additional order, or inquiry, before a magistrate might be desirable in the case of private patients, generally speaking.

"A. Before a magistrate?

"Q. Yes; such a one as is now in use with regard to pauper patients?

"A. I really do not believe that there would be any additional security in such a provision; in signing the orders for pauper patients many magistrates regard it, if a certificate is in due form, as a ministerial act. They sign the order merely as a matter of course. Such an arrangement with reference to private patients might cause delay, as it does sometimes in the case of paupers, when there is a difficulty in finding a magistrate. I think, also, it might increase the prejudice against asylum treatment. The public would look upon insanity as in some way connected with crime, if a patient had to be taken before a magistrate.

"Q. Would you recommend that the certificates should be renewed from time to time?

"A. I have thought over that, and I do not think that would be any additional safeguard.

"Q. Might not some system of medical referees in such a case possibly be established instead of taking any chance medical man that comes first? Might there not be some persons who would pass an examination in mental diseases to whom all these cases might be referred instead of taking the first chance medical man?

"A. It might be so, but I think it would tend rather to diminish public confidence to have specialists signing certificates. The public would come to associate them with mad doctors, and my impression is that it is better to have general practitioners sign the certificate. The public have more confidence in the decision of the ordinary family doctor."

Dr. Browne's testimony was that early treatment was of the greatest possible value.

Dr. John Charles Bucknill, over eighteen years a medical superintendent, and Lord Chancellor's visitor in lunacy thirteen and one-half years, testified:

"Q. With reference to the admission of private patients into asylums and their discharge, what do you think the principle of that ought to be?

"A. I think the principle should be to make the admission as easy as possible in order to provide for early treatment, and to make the discharge as easy as possible in order also to provide for early treatment, for if there is difficulty in getting a patient out of asylums there will be a disinclination to send them in. That is a point which has been very well worked out by the Scotch Commissioners in Lunacy, and they have proved it by statistics."

Dr. Bucknill expressed the opinion that with the medical certificates in case of private patients the law should provide that the person who gave the order should bear some relation to the patients, saying: "As to the person himself, the statute gives no indication as to who the person should be, and, in point of fact and practice, the most improper persons may sign the order. A gentleman's footman may sign for the gentleman's son; a foreigner will sign for his lunatic friend and leave the country immediately; a solicitor's clerk will sign; all manner of people will sign—people who cannot be held responsible.

"Q. You think the order is considered more as a matter of form, and that the certificate of the medical man is really relied upon?

"A. No; the real power is possessed by the man who signs the order. The certificate and the order go together. With regard to the admission: the patient once admitted, the man who signs the order holds the staff to such an extent that the patient cannot be removed from the asylum unless the person who signed the order is incapable. If he becomes incapable by disease or by insanity, or if he is dead or has left the country, then the statute lays down the rule that certain other persons may order the discharge; but

otherwise, if he is not incapable, no one but the person who has signed the order can procure the discharge of a patient once admitted into a licensed house or a hospital.

"Q. What remedy would you propose for such a state of things as that?

"A. It is very difficult to meddle with the existing forms without increasing the difficulty of obtaining early treatment; I think that the rule which has been laid down with regard to the discharge of patients from asylums, namely, that if a man who signs the order is incapable, then the husband or wife could act, and if there be no husband or wife, then the father or mother, or the next of kin may very well be introduced in the order for admission; that if a patient has a husband or wife he or she should sign the order, or, in default, the father or mother, or next of kin, or a solicitor could for any of these or in case of a lunatic who has no relative to be found, I think a solicitor might be employed to act for any friend.

"Q. You have travelled a good deal in America and examined the state of things there; can you tell us what the American law is in regard to the admission and detention of persons in asylums?

"A. It varies in every State. A good deal of change has taken place quite recently; the State of New York seems to have made the best change. There the certificates before the year before last could be signed by any two men calling themselves medical men. The new law requires that they shall be qualified medical men and that they shall also have a certificate from some judge of a court of record, to whom they are personally known as competent for their duties. An attempt is being made to create a class of medical men who understand something about insanity and are capable of giving certificates.

"Q. Have you considered whether easy discharge from asylums would tend to the more frequent admissions to the asylums in the early stages of the disorder and to the early treatment of the disease?

"A. Sir James Coxe has clearly pointed out that not only the highest percentage of cases but the shortest duration of treatment in Scotland is found in the Renfrewshire asylums, which are parochial asylums, in which the inspectors of the poor can put a patient on the outbreak of insanity without any difficulty, and also remove him without any difficulty whatever. He points out that the authorities of asylums might, perhaps, unwillingly increase the indisposition to place patients in asylums by throwing impediments in the way of their easy removal from asylums. I take it that the succession of events which Sir James points out is this,—that you get easy discharge from these Renfrewshire parochial asylums; therefore you get early treatment and a much larger percentage of cures effected in short time.

"Q. You think that in all cases it is a great object to get early treatment?

"A. Yes; I think that is the greatest point to aim at.

"Q. Therefore, if the facility of obtaining the discharge would induce the people to send all patients in the early stages to the asylums, the percentage of cures would be greater and the cures would be more rapid?

"A. Yes; that is exactly what I mean."

Sir James Coxe, of the Board of Lunacy in Scotland, testified:

"Q. In the report of the General Board of Commissioners of Lunacy for Scotland, for the year 1859, signed by yourself, there are one or two paragraphs which I should like to read to you: 'It cannot be too often repeated that, in the treatment of insanity, loss of time is unfavorable to recovery, or that every impediment that is thrown in the way of immediate treatment acts most prejudicially upon the patient by tending to render permanent the aberration from normal action which, under favorable circumstances, would speedily have subsided.' Is that your opinion?

"A. Yes, sir.

"Q. 'We are therefore of opinion that asylums are capable of rendering to mankind far greater services than they have yet achieved;' is that also your opinion now?

"A. Yes, sir. Sir James Coxe testified that the medical certificates were acted upon in Scotland by the sheriff.* 'In the case of the sheriff there is no reference to any independent medical man at present.'

"Q. The sheriff himself determines for himself whether the grounds stated by the medical men are sufficient?

"A. Yes.

"Q. He does not refer it to any independent medical man?

"A. No; he judges for himself.

"Q. In your judgment, would it be an improvement that the certificates, before being acted upon, should be, if necessary, canvassed, and further inquiry directed by some independent medical official?

"A. I think it would merely complicate matters.

"Q. You think, in practice, it is a sufficient precaution, the sheriff examining the certificates and the grounds stated in them?

"A. I think so."

Dr. Harrington Tuke, Fellow of the Royal College of Physicians of London, having had practice at Hanwell, under Dr. Conolly, and at present having charge of a private asylum at Chiswick, testified:

"Q. Would you suggest that no certificates should be signed except by medical men who had special practice in lunacy?

"A. I would rather suggest that the knowledge of lunacy should be made more general than it is.

"Q. You would not have a special class of medical men for lunacy cases?

"A. No; I think not.

"Q. We have had the opinion already expressed both ways, that there should be a special class of medical men, skilled in lunacy, who should sign one of these certificates, and also that it would be a mischievous thing to have any special class of that sort?

"A. I think there would be less confidence of the public in specialists in any particular class than any two physicians taken at hazard, but I think that the physicians should be better trained.

"Q. Are you of opinion that it would be desirable, also, that the medical certificate should have a temporary effect, or that the certificate should be signed by medical men who had special knowledge of lunacy?

"A. No, I am not so; the result of giving it to special medical men would lead to still greater distrust than there is at present, because, as far as I have seen, the ignorance of medical men leads them to refuse to sign medical certificates.

"Q. Would you not think it desirable to limit the effect of the certificate?

"A. No, it would lead to so much mischief in so many cases that I doubt its efficacy. It would do so much mischief to the patient by the necessity of a fresh examination, and then there are actually so few cases where there is any doubt, that it would be a great pity to make a general rule for them.

"Q. Do you consider that if any obstacles were placed in the way of the committal of the insane to public or private asylums that would have a tendency to interfere with the cure and with that early treatment which, we have some evidence, is thought to be necessary for cure?

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* NOTE.—The sheriff in Scotland approves certificates instead of the judges, as in the State of New York. His office is still that of a local judge, and not merely ministerial, as in England.

"A. Any delay in instant medical treatment is most disastrous. Dr. Conolly and myself went over the statistics of three asylums with which we were connected. We found that seventy-seven per cent. that were treated under three months recovered; those that were treated later diminished in an absolutely geometrical ratio, until at last it sank to, after twelve months, something like twenty per cent. fully cured. I think any obstacle in the way of medical treatment, either in an asylum or otherwise, most injurious.

Dr. Henry Maudsley, a physician, practicing in London, testified that, in his opinion, the law, "with regard to the admission of patients is sufficiently stringent and quite as stringent as can be properly consistent with the treatment of insanity in its early stages." He testified that if insanity was to be cured, the person must be put under treatment early, "because recoveries are entirely in proportion to the early stage at which treatment is adopted. If regulations are made more stringent than they are now (and, indeed, the present regulation operates to some extent in that direction), the friends of patients will, instead of sending them from home, as is almost essential in the case of insanity—unlike, in this respect, other diseases—keep them at home under improper conditions, and so very much injure the chance of recovery."

As to any alteration in the law touching the certificates he testified: "I have considered the matter. If it is considered desirable, as I have heard suggested, that the certificates should go before some public official before they were acted upon, it seems to me that no public official would be in a better qualified posttion, to judge of the value of the certificates, than the commissioners, to whom exact copies are sent within twenty-four hours; indeed, not really so much so. If he entered really into the matter in each case, it would be a very anxious responsibility and a formidable matter for him to undertake; and, if he did not, would simply become a mere matter of routine, adding to the publicity, adding to the expense, and adding to the delay of getting a patient under care, and would make the early treatment more difficult than it is."

Again, he testified that people "would shrink very much indeed, according to my experience, from having a public officer come in to proclaim, say a young lady of eighteen, a lunatic, or a wife after childbirth who is insane, perhaps, for a month or two. To a professional man such a public thing might be almost ruin."

"Q. Would there be greater publicity in that way than there would be from a certificate given by a medical man in the neighborhood?

"A. Yes, it would be thought so; because, as a matter of fact, certificates are often given in this way: The medical man of the family, who is in regular attendance, gives one of the certificates. He calls in a physician in consultation, who then sees the case separately afterward and gives the second certificate. There is no alarm of the patient. It is simply an ordinary matter of consultation as it appears to him."

Dr. Duckworth Williams, medical superintendent of Sussex County Asylum, Hayward's Heath, testified:

"Q. Do you attach importance to the pauper lunatics being sent early to the asylum?

"A. Very great.

"Q. From the lunatic wards of the workhouse?

"A. They should be sent at once, in my opinion, without going to the lunatic wards at all.

"Q. You think that as soon as the ordinary forms are complied with the patient should go at once to the asylum and not go to the workhouse first?

"A. Certainly.

"Q. Do you say that because you think there is more chance of cure in such cases?

"A. Because there is more chance of cure, and also on the score of economy."

Dr. Williams testified to the evil of the insane being taken to the workhouses without any

certificate, which was the common custom, and in condemning this, he spoke the opinion of all the authorities.

The Right Honorable the Earl of Shaftesbury, attended before the committee by permission of the House of Lords, and was examined. He testified that he had been a member of the lunacy commission "now close upon fifty years. I was associated with Lord Gordon on the first committee of inquiry in 1828, then in 1829 in bringing in the first bill received; since that time for twenty years I was in the habit of visiting continually." He was permanent chairman from 1845. He testified to the law generally, and to changes from time to time in the statutes.

"Q. Do you consider that the facility with which patients are admitted into asylums is not too great at the present time?

"A. No, certainly not. I think that the whole of our experience confirms us in the opinion that it is not. We stated so in 1859 and we state it still more emphatically now. I cannot recollect a single instance in which a patient has been brought into any asylum in whose case there were not sufficient grounds for saying that he was a proper subject for cure and treatment; I can hardly recollect a single instance. I see, by referring to the evidence which has already been given before your honorable committee, that such is the testimony of every man of experience who has been consulted on the matter. It was likewise the opinion of the committee that sat in 1859, for they reported in that sense.

"Q. At the same time there is a feeling which has been expressed, not only generally, but by witnesses before the committee, that a large number of persons are admitted to the asylums in a state of sanity and kept there?

"A. I have no doubt those statements would be made, because I never knew the case of a patient, either under confinement or after confinement, who did not say that he had been most unjustly confined. I hardly know an instance. I do not know that any instances have been adduced to prove the truth of that allegation.

"Q. At any rate, it is your Lordship's opinion that the admission of patients into an asylum is now sufficiently guarded?

"A. I think so.

"Q. Would you say the same with regard to their detention there? Is it not the case that they are sometimes kept there longer than is necessary?

"A. I do not think they are so now; it was rather my opinion in 1859 that, under some circumstances, they may have been detained beyond the time that it was absolutely necessary, but then I think that a great deal was to be said in extenuation of that. It is a great responsibility to send out a patient upon the world, both with respect to the patient himself and in respect to society, before you are satisfied that he is cured or, at any rate, in such a state that he can be safely trusted. Since 1859, I should very much modify the opinion I then gave.

"Q. Does your Lordship consider that many of the stories that we hear, from time to time, of conspiracies and of ill-treatment are themselves delusions in the minds of people who are intending to say what is accurate?

"A. I think so; and it is a very remarkable thing that in many instances one of the first indications that a man gives, or a woman gives, of a state of aberration, is the belief of a conspiracy. I have never heard of a conspiracy being formed for a purpose of that description."

In regard to chronic cases and others being taken first to the workhouse, his Lordship testified:

"I think it highly necessary that in every instance the patient should go to the asylum first, and pass from the asylum to the workhouse, and not from the workhouse to the asylum, which is very often the case. He gets into the workhouse and there is detained,

when if he went to the asylum it would be adjudged at once whether he was a fit case for the asylum; and if not, he would be sent back to the workhouse. In that way a great number of the recent cases are kept back to a very late period, when they might have been treated and sent back to the world perfectly well.

"Q. The practice is exactly the reverse of what it ought to be?

"A. Yes."

He testified concerning suicidal and homicidal cases to show the absolute necessity of taking those cases in due time.

After dealing with the statistics of suicide at large, he stated that there were then in confinement in the various asylums, six thousand and ninety-six suicidal patients. Referring to the criminal asylum at Broadmoor, he said that, leaving out all that were there for minor causes, "there were one hundred and forty-five men charged with murder. In seventy-five cases the insanity was not recognized before the commission of the crime. In twenty-nine, insanity was recognized, but the persons were reputed harmless. In thirty-three, the insanity was recognized in the persons, not probably recognized as being altogether harmless, but insufficient precautions were taken. In eight, exact circumstances were not known."

Of ninety-eight "charged with attempts at murder, maiming, or stabbing, in forty-two the disease was not recognized before the commission of the crime; in twenty-nine they were reputed harmless; of twelve insufficient care was taken; and in fifteen the exact circumstances were not known. When you come to the women, there are seventy-one women charged with murder; in twenty-eight the insanity was not recognized before the commission of the crime; in thirteen the insanity was recognized, but the persons were reputed harmless; in twenty-three the insanity was recognized and the persons were not regarded as altogether harmless, but insufficient precautions were taken. Then you come to the stabbing: in four the insanity was not recognized; in six they were reputed harmless; in two sufficient precaution was not taken." He adds: "This is a very important matter, because it shows the very large number of cases in which, through inattention, the insanity is not detected till an overt act has been committed. That is the evil way in which a large proportion of the public judge of sanity or insanity. They will never hold a person to be insane until some overt act has been committed, and that is always, invariably, the case before juries. Then an overt act having been committed furnishes a proof that the disorder is very far advanced, almost to be inveterate, and consequently incurable. What I state shows the absolute necessity of great precautions, the absolute necessity of paying attention to the earliest stage of the disorder, and though I could by no means render admission into the asylums more easy than it is, I most undoubtedly would not render it more difficult, because I am certain society is in very great danger. We always have felt, as commissioners, that we have a double duty. We have a duty to the patient and a duty to society. We have a duty to the patient to see that he is not needlessly and improperly shut up; but we have also a duty to society to see that persons who ought to be under care and treatment should be under care and treatment, and, moreover, that they should not be set at large before they can be considered safe to mix in society.

"Q. Do not these facts, which are very remarkable, point rather to a want of knowledge of lunacy among medical men?

"A. No; I think not. I am not going to say that there is sufficient knowledge of lunacy among medical men, but such cases as this have never been brought under their observation; they have been suffered to roam about; nobody has taken any trouble about them; in the case of many of them the family did not suspect the madness; they might have thought the man was queer, and they never thought of consulting a doctor

on the matter. I have no doubt a great number of medical men, if they had seen such a case at an early period, would have come to the right conclusion about it. As I was saying, the large mass of society, even educated persons, are wholly unable to form an opinion unless they see something that is very decided; that they consider an aberration; something very peculiar; something out of the common way; another is this,—it very often happens a great change of character is very often the indication of coming insanity, and then many people say, and very naturally, 'What is the matter with this person? he is getting very cross; he is quite a changed man; he is not half as good-humored as he used to be; he has become crabbed and ill-tempered;' they do not see that this very often is an indication of his approaching insanity; they put it down to a sudden change of temper.

"Q. Has your lordship any suggestions to make upon that point?

"A. No; I have no suggestions to make, because I am very unwilling to say anything that should restrict in any way, more than is now restricted, the person or liberty of the subject; I only wish to call greater attention to these things, that people may have their eyes open, and then they may put their heads together and see if they can devise something by which a remedy may be applied, but I have no particular suggestion of my own to make; I only give it as a very striking fact, and one that should put us on our guard very much against juries, because they never deal with the matter unless there is an overt act, which overt act, ninety-nine cases out of one hundred, is a proof that the disorder is incurable."

In regard to medical certificates his lordship testified:

"It is very remarkable, taking it altogether, that the certificates have been so sound, considering the great number that have been given every year. Of course, we must admit that they have been signed by medical men who have no very extensive knowledge of lunacy, but it is certainly very remarkable that the number of certificates which have passed through our hands since 1859—the date of the last committee—amounts to more than 185,000, and yet of all those certificates I do not think so many as half a dozen have been found defective. It sounds very well to say that persons acquainted with lunacy should be the only persons to sign certificates, but the fact is, as matters now stand, that a great amount of scientific knowledge as to lunacy is not possessed by many people; there are a certain number who are well-informed, but the great mass of the community know very little about it, and with the large number of the insane—dispersed, as they are, all over the country—you must trust to the medical men of the several districts. I have a very strong opinion on this point. The certificates hitherto have been very correct, and I am quite certain that, out of the 185,000, there was not one who was not shut up upon good, fair, *prima facie* evidence that he ought to be under care and treatment; such is the testimony of all the physicians of note who have been summoned before this committee; for what does that arise from—it does not arise from the great knowledge of the medical men of the lunacy that they handle, but it arises in a great measure from the habit of keeping back the patients so long, because the parents and friends do not like to admit to themselves that the patient is affected, and so delay to call in a medical man. And then begins, when the medical man is at last called in, the fear and apprehension that the patient may be sent to a lunatic asylum and the whole affair become public; so that when the final examination is made by the medical man, who has to sign the certificate to send them to an asylum, the symptoms are so evident and so pronounced that few people can mistake them. I have very little doubt that such is the case and such is the reason why we have so few faulty certificates. But, on the other hand, what follows from that course? Why, that the cases are very far advanced, and have got pretty nearly in the category of the incurable.

"Q. And this is not very satisfactory?

"A. Very far from it."

His lordship testified against special doctors making certificates:

"I think something has been said about having what they call a system of special doctors. I confess to you that I have a very great fear of a special doctor. But, assuming them to be good, in the first place they must be very numerously spread over England and Wales, because they are wanted at the instant, and were there not an ample supply of them you have to send a great distance to reach these special doctors. I should like to see how Parliament would define a special doctor before I can give an opinion. I confess I should be very much alarmed if there were persons who kept themselves exclusively to that study without a constant experience of both, of all the various circumstances that beset lunacy at large and under confinement, moral as well as physical, that attend it; all the social circumstances, the ten thousand other circumstances. . . . . I remember the case very well of a medical man, a doctor, an excellent man, who thought that I had some influence in obtaining the appointment of medical men to the commission. I knew him very well. He came to me and told me what he wished. To show his extraordinary knowledge of the subject he gave me a sheet of paper as big as that, with a list of the forms of insanity. 'My dear sir,' said I, 'this will never do. If you reduce your principles to practice you will shut up nine-tenths of the people in England;' and so they would. If you have special doctors they would shut up people by the score.

"Q. There was another proposal, which was to require a certain knowledge of lunacy on the part of the medical officers of health, and who are scattered over the country, and to employ them as checks upon the asylums and as a kind of deputy visitors, to supplement the visits of the commission?

"A. To that I should very much object. I wish to speak with the greatest respect of them, but I think medical officers of health, to a great extent, are young men and uninstructed men who have taken the office merely because they think it gives them a position and qualifies them to get on in their profession. They are not likely to have any great knowledge of lunacy. Then, again, being local people, they would be in friendship or in antipathy with the superintendents of asylums. Consider another point: we must do everything we can to keep the best medical men in the service and to get them to sign the certificates. I am sorry to say that now the very best medical men refuse to have anything whatever to do with the certificates, they are so afraid of the responsibility and of being 'hauled over the coals,' as the phrase is, that they will not do it.

"Q. Another proposal was to take a person whose mind was affected to a hospital where he would be treated as he would be in any other hospital, and that afterward, provided he became fully insane, he should go to an asylum, but that otherwise he might be restored to society without having any taint of insanity upon him?

"A. I think it would eventually come to the same thing. These probationary asylums would be considered lunatic asylums, and it would be said of the people taken there: 'Oh, you know he escaped going to the asylum, that is true, but he was in a probationary asylum. He was so queer and so odd that they were obliged to send him there.' The taint of lunacy, which I see this committee is so justly afraid of, would be as much fastened on him as if he had gone direct.

"Q. In process of time the hospital would get the character of a lunatic asylum.

"A. Yes, they would be called semi-lunatic asylums and all that sort of thing. They would come under the same category at last."

In regard to certificates his Lordship further testified:

"Q. Should you not think it an additional security to the freedom of the subject if one of the signers of the certificates was a person in some official capacity? Now, as your Lordship is aware, there are two medical men—they may be surgeons, apothecaries, or physicians—who sign the certificates. Do not you think it would be an improvement if one of the signers of the certificates was in some public capacity?

"A. No, sir. In the first place I should be sorry not to have two medical certificates for the confinement of any patient in a licensed house. I do not know where we could find a public man who was also a medical man.

"Q. By a public capacity I meant an officer connected with the union, or somebody responsible to the public.

"A. I think it was the right honorable chairman who put the question to me the other day on that subject. I said I strongly objected to an officer of the union. He was not a man of sufficient standing. Oftentimes he has merely taken his place because it gives him a status. He is not a man of sufficient standing. Some of the medical men who sign the certificates are of very high standing and degree, and you could not allow them to be overruled by an inferior officer.

"Q. Do you not think that it would be an improvement if the certificates did not partake of the final character they now assume; that they should be of a more temporary character than they are now?

"A. I do not think so.

"Q. We were told that in Scotland the patients cannot be sent to the lunatic wards of workhouses without a certificate. Does your Lordship consider this a good plan?

"A. An excellent plan; it is not the same with us.

"Q. In England, of course, a lunatic may be sent to the lunatic ward of a workhouse without any certificate at all?

"A. Yes; the relieving officer may send him in, or any one may send him in.

"Q. He only wants a certificate signed when he goes into an asylum from the lunatic ward?

"A. Quite so.

"Q. You think the Scotch plan of requiring the certificate upon the lunatic going in the lunatic ward of the workhouse is preferable?

"A. Very much preferable.

"Q. We have had evidence from the Scotch Commissioners in Lunacy, in which comparisons very favorable to the Scotch system have been drawn, with regard to the intervention of the sheriff. Your Lordship has, I think, already expressed an opinion with regard to the intervention of a public authority. Would you consider that the prospects of cure derived from placing a patient under early treatment would be considerably interfered with if the law were altered so as to necessitate the intervention of the magistrate in this country?

"A. Most undoubtedly; the great fear in England of so many people is publicity, and anything that tends to bring the patient before the public and to make the case of a patient notorious, would induce people to keep that patient so long as they could before they submitted him to the treatment of an asylum or of a single house. It would interfere very materially with it.*

"Q. On the whole, your opinion is most decided that the intervention of the magistrate

* In the present movement toward lunacy reform in our own country, all sides of the question should be attentively weighed and considered, and especially the above point of the possibility of doing the patient himself great harm by measures intended for his welfare by reformers.

would be injurious to the person, as regards his recovery, and no protection to him as regards his liberty?

"A. None whatever. I think it would take away nine-tenths of the protection he now has. I cannot conceive anything which to my mind would be worse. I will do anything that I can in the world to protect the patient, but I know if I were to assent to what is proposed I would assent to that which would be irreparable injury.

"Q. I think your Lordship is under some misapprehension as to the part that the sheriff acts in the matter: he has the option of acting according to his own discretion, either ministerially or judicially. He may judge, and usually does, of the fitness of the evidence upon which the medical men grant the certificate, or he may not do so. He may judge, and usually does, of the fitness of the persons to give evidence under the circumstances; for instance, relationship, or anything of that kind, might be regarded as a disqualifying characteristic in a person signing a certificate?

"A. That is what we should object to; we should object to any inexperienced layman taking upon himself to reverse the decision of the medical man.

"Q. He would not, in that case, reverse their decision. He would merely remit it to other medical men, who, in his opinion, were competent to grant the certificate.

"A. It is all very right that it should be so, but then see what it ends in. It ends, after all, in the opinion of a medical man, for it is only one set of medical men against another set."

Hospital Ward for Sick Men.—In my report for 1854 I stated: "Our arrangements for taking care of the sick, though probably as good as those of any other similar institution, must be regarded as very imperfect. All sick patients should be immediately removed from the wards to a hospital department properly arranged, where every attention demanded by their condition could be bestowed; where the physician could visit them frequently during the day and in the night, if necessary, without disturbing others; where those very ill could be visited, and, if advisable, nursed by their friends, and the dying be administered to without exciting the fears of others."

I have in several reports since recommended the erection of a hospital for the sick. In the second annual report of the State Board of Charities, in referring to the asylum, they say: "There should be erected two small wards, one for each sex, for the treatment of the sick and feeble, that their friends may be able to visit them and remain near them without disturbing a large number in a general ward. This improvement is demanded, not only by humanity, but decency, especially in the case of female patients, who are frequently admitted to the asylum in a condition which justifies and demands seclusion and the most tender care."

In my report for 1872 this matter was again urged upon the legislature and the attention of the governor and comptroller was called to this point when they visited the institution, and they approved the application. Finally, in 1875, an appropriation was made for a special hospital building for sick women. These arrangements have proved most satisfactory. There should be hospital wards for sick men also. This is a great defect which should be remedied. The facts and reasons heretofore given in support of the measure have increased weight, with the enlargement of the institution. I sincerely hope the legislature will make the necessary appropriation. A small two-story building, placed a little back of the front wing and connected by a corridor, for this purpose, would not cost over $15,000, and would make provision for fifteen patients and the necessary attendants, bath-rooms, etc.

Amusements.—Amusements are conceded to be a very necessary feature in connection with the modern hospital for the insane, and undoubtedly a very important means of comfort, enjoyment, and recovery. Few of the institutions in America are adequately

equipped in this respect. Amusements are universally considered an important auxiliary in the treatment of insanity. In the early history of the institution theatrical and other entertainmehts were held upon the wards by the erection of a temporary stage, taken down from time to time. These, however, were limited quarters, and there was but room for a very small proportion of the patients to attend.

Later a small theatre room was arranged in the attic of the central building, which, though a very great improvement on the former accommodations, has two very serious drawbacks. First, the limited capacity of the room, it not being large enough to accommodate more than one-third of the patients at a time; second, its loeation in the attic of a building four stories high. The amusement halls of American institutions are in sad contrast with those in Great Britain. Dr. Bucknill, in his visit to this country in 1875, was present at one of our entertainments, and very justly says in his remarks upon this institution: "I assisted, by my presence, at some capital amateur theatricals in which the amateurs were patients and attendants, and the audience of lunatics were neither dull nor disorderly. The recreation room, however, is not worthy of the asylum, and the governors would do well to provide a better one." In connection with this institution and the class of patients we receive, a recreation hall should be built large enough to accommodate the whole household, and should be built upon the ground floor, that all the old or feeble persons and all patients who could reasonably control themselves could be present at entertainments. Such a building could be erected without great cost in the rear court-yard which persons could reach from all parts of the building, and where there would be no uneasiness or anxiety in regard to escape in case of any accident. A plain structure in accordance with the surrounding rear buildings could be put up at an expense of not to exceed $10,000.

Statistics of Bloomingdale, N. Y., Asylum.—The annual report of the Bloomingdale Asylum for the Insane, New York city, for which we are indebted to Dr. Charles H. Nichols, the medical superintendent, shows that during the year 1882 there were treated in this institution 330 patients,—157 men and 173 women. The number of patients under treatment on the 1st of January, 1882, was 224; admitted during the year, 106. The discharges were: recovered, 39; improved, 34; unimproved, 11; died, 23; remaining at end of year, 223 patients. Ninety-two of the admissions, or 87 per cent. of the whole number admitted, were first attacks. Respecting *restraint*, Dr. Nichols says: "I am in full accord with what may be properly called the American doctrine and practice in the use of mechanical restraint and seclusion in the treatment of the insane, which is, as I understand it, that neither mode of treatment shall ever be resorted to, unless, in the opinion of a competent and responsible medical officer, protection, in particular cases, against violence, exhaustive activity, the removal of surgical dressings, etc., etc., can be effected more easily, completely, and beneficially to the patient than the necessary end can be attained by either the hands of attendants, medicinal agents, shower and douches, which I consider inadmissible, ex-

cept in a very limited number of cases, or 'pack,' wet or dry, which are obviously a very positive form of mechanical restraint, although their therapeutical advantages may now and then be superior to any substitute for them, and that it is the duty of the practitioner to resort to mechanical restraint or seclusion whenever he clearly sees that it is needed, upon the grounds stated. Of course, the actual practice in the use of restraint varies more or less in different institutions like this, as I believe it does, actually and necessarily, in every other enlightened country, and is governed, as are other measures of treatment, by the training and character of the medical officers in charge, the opinion and support of trustees, the number and character of patients with respect to the extent and quality of their accommodations, proportion of attendants to patients, scale of expenditure, and other agencies of treatment. The restraint needed in the same institution will vary greatly, according to the varying condition of patients. While I still conscientiously entertain the views just expressed, in common with the great majority of my American brethren, and am entirely unwilling to be governed by a prohibitory dogma or an arbitrary proportion to patients in the use of restraints, I am of the opinion that the circumstances that justify its average use in more than 2 or 3 per cent. of the cases under treatment must be quite exceptional."

The Twenty-third Annual Report of the State Asylum for Insane Criminals, at Auburn, N. Y., for which we are indebted to the courtesy of Dr. C. F. MacDonald, the superintendent, shows by its statistics that, from the opening of this asylum in February, 1859, up to October 1, 1882, the total number admitted was 629; the total number discharged, 488; the total number discharged recovered, 166; the total number discharged improved, 67; the total number discharged unimproved, 116; the total number discharged not insane, 57. Speaking of the criminal insane, Dr. MacDonald says:

The Criminal Insane.—A great deal has been said in recent times respecting the psychology of crime and its relations to mental disease. Theories have been advanced by various writers to show that tendencies to crime and criminal propensities are frequently inherited conditions. Extremists on the one hand have told us that all criminals are victims of mental disease, or infirmity, and consequently not responsible for their acts; while, on the other hand, certain writers have proposed that lunatics should be held accountable for acts of violence, and some have even gone so far as to suggest that dangerous insane men should be disposed of in the same manner as are hydrophobic dogs.

From a somewhat extensive observation of several years, respectively, of the criminal and non-criminal insane, I am led to believe that the element of crime, when interwoven with insanity, exerts a modifying influence upon the mental manifestations of that dis-

ease, and that to this extent, in a large proportion of cases, the criminal insane, medically speaking, may be regarded as a distinct and separate class, the analogue of which is not found among the ordinary insane. They present certain characteristic mental peculiarities which experience in observing this class enables one to recognize as the indelible stamp of crime, and although the line of demarcation may not always be apparent to the casual observer, its existence, as a rule, can be discovered and demonstrated, if time and facilities for careful observation be had.

In my experience with the criminal insane, now nearly five years, I have been struck with the frequency of cases in which there was an absence of expressed delusions, although the manner and conduct of the individual was clearly indicative of a delusional state. Comparing these individuals with their former selves, we find undoubted evidences of a departure from their normal mental state. They have become sullen, morose, and morbidly irritable. They rebel against the ordinary rules of discipline, and make unprovoked assaults upon those around them, without apparent motive and without offering any explanation therefor. That they are suffering from impairment of bodily functions is shown by sleeplessness, loss of appetite, coated tongue, foul breath, constipation, a "greasy" condition of the skin, and a livid, puffy appearance of the extremities, indicating a relaxed state of the bloodvessels. They are generally coherent in conversation, do not complain of being ill, nor apply for medical treatment. They frequently continue in the performance of their allotted tasks in prison for months before the attention of those in daily contact with them is attracted to their mental disturbance. From this condition they either recover or gradually drift downward to complete dementia, with no outward exhibition of delirium or mental excitement, to mark the course of their disease. The occurrence of acute, delirious mania, according to my observation, is exceptional among the criminal insane, melancholia, and dementia, with an occasional case of subacute mania, being the predominant types of insanity observed here. A certain proportion of cases, and usually those of hardened criminals, are characterized, in their mental manifestations, by the most pronounced vicious tendencies, their insanity apparently expressing itself in a marked exaggeration of the depravity and vice displayed by them prior to the onset of their disease. On the mental side, this is substantially the only evidence of disease which these cases present. Physically, however, their condition is marked more or less by the signs of bodily impairment above referred to. Being known to the authorities as abandoned and depraved individuals, it is not surprising that their insanity is not recognized by casual observers, when it expresses itself in the manner I have indicated.

We may readily admit such cases into the category of mental disease, without in any way countenancing the dogma that insanity and crime are convertible terms. The conduct of such cases, when first admitted to the asylum, is characterized by the most striking evidences of depravity. They are profane and obscene in language; tear and destroy clothing, bedding, and furniture; strike, steal, lie, and soil themselves and their surroundings, apparently from mere wantonness. They sleep badly, and display the resistance to the effects of sleep-producing remedies common to lunatics. They are, generally, alike indifferent to coercive measures and to comfort, and it is only by constant and persistent endeavor, firmly but kindly applied by those in immediate charge of them, that they can be trained into decent habits and deportment. From the foregoing it might naturally be inferred that the successful management of the criminal insane would involve greater difficulties than are encountered in the care of the ordinary insane. And such was my belief in the early period of my experience with this class, but further observation and experience have served to convince me that, with facilities specially adapted to its needs, an asylum for the criminal insane can be conducted on the same general principles, and with as

good results, except in the matter of cures, as are hospitals for the ordinary insane. Visitors passing through the wards of this asylum are struck by the marked absence of noise or disturbance of any kind, this being the usual condition night and day. They not unfrequently ask to be shown "the violent cases," and "those you have to keep tied up in their cells," or in "strait-jackets;" and when informed that no mechanical restraint of any kind is used here; that we have no cells; that there *is* no "disturbed" ward, and that the patients they have seen are the worst cases we have, they are apt to look incredulous and doubting, apparently being unable to realize that criminal lunatics are controlled by kindly influences, and that order and quietude prevail among what they had supposed to be the most violent class of insane. The principal difficulties encountered in the management of this institution are, the prevention of escapes, and a propensity of certain homicidal patients to obtain and conceal articles for the purpose of using them as weapons of assault. To prevent these occurrences involves the exercise of constant care and vigilance. Cases of simulated insanity are obviously of much more frequent occurrence here than in general asylums. They, of course, are troublesome while they remain with us, but detection is not difficult, and is immediately followed by a return to prison. If it were the rule, and generally so understood in the prisons, that a convict detected in an attempt to feign insanity, would forfeit the commutation of sentence allowed him for good conduct, it would, I believe, render such attempts of rare occurrence.

Insane criminals, particularly of the convict class, in their efforts to escape, frequently display a wonderful combination of shrewdness, cunning, and ingenuity. Patients of both classes, who have committed crimes against the person, are more dangerous, but less inclined to escape than are those who have committed crimes against property.

Owing to the low walls inclosing the grounds about the institution and the absence of guards upon them, together with the other difficulties referred to, it is obvious that the privileges allowed patients here have to be more restricted than would be necessary in other institutions for the insane.

In connection with this subject, and illustrating, in a general way, some of the principles I have endeavored to carry out here, the following extract from the third annual report of the State Board of Health, Lunacy, and Charity of Massachusetts, respecting a recent visit of observation made to the asylum by a committee of that board, may be of interest:

"The only criminal asylum similar to those in Great Britain which has been in operation for any considerable time in the United States, is that maintained by the State of New York in connection with the State prison at Auburn.* The Auburn Asylum was visited during the summer by the Inspector of Charities, and again, on the 9th of November, 1881, at the special request of the board, by Dr. Hitchcock, Dr. Walter Channing (who had been for more than two years a medical officer of this asylum at a former period), and by the Inspector of Charities. From the notes made at these visits, and from the published reports of this asylum, the following statements of fact and opinion are drawn:

"The State Asylum for Insane Criminals was opened in connection with the Auburn State Prison* on the 2d of February, 1859, and has had an average number of patients, during the twenty-two years following, of something less than 100, although of late years (since 1874) the number of patients has averaged more than 100, and, in 1880, rose to

* This is an error. The asylum bears the same relation to Auburn prison that it does to the other prisons of the State. It has a separate organization and is separated from the prison by a high wall.—C. F. M.

142. At the last visit of the Inspector of Charities it contained 135 patients, 10 of whom were women, the average number having fallen a little during 1881. The whole number of patients admitted since February 2d, 1859, does not much exceed 600, and of those less than 40 have been women. Upon inquiring of Dr. MacDonald, the present superintendent, why the State of New York, with a population of more than 5,000,000, should have so small a population in its only criminal asylum, he stated that the period of detention for his patients was too short, and that there were, in the State of New York, several hundred of the criminal insane, practically of the same class as those at present under his charge, who, in his opinion, ought to be in such an asylum, provided it were large enough to contain them. He even thought the number of such patients, if the laws were so modified as to allow their detention in his asylum, might, in a few years, reach 500. But among those, he supposed that the proportion of women might be no greater than it had been among the actual patients of the asylum; that is, less than one in fifteen.

"Previous to the first appointment of Dr. MacDonald as Superintendent, in April, 1876, the management of the asylum seems to have been complicated with the management of the prison—both being guided too much by political consideration. Dr. MacDonald's appointment was non-political, and under his administration much has been done to improve the treatment of the patients and the character of the attendants who take charge of them. At the present time the patients in the Auburn Asylum, although to a large extent belonging to the worst class, both of criminals and of the insane, appear to be treated with as little harshness and with as much success in regard to recovery, rate of mortality, etc., as is found in the ordinary insane asylum, where chronic patients largely predominate.

"'We found one or two patients secluded and one undergoing mechanical restraint,' is the statement made by the gentlemen who visited the asylum on the 9th of November. A considerable number of the patients labor regularly outside of the wards, and a separate ward has lately been constructed for the residence of these daily workers. The average cost of each patient in the asylum, which has ranged, during twenty-two years, between $150 a year and $600, now stands at about $200, or a little less than $4 a week, yet the food, clothing, and general care of the patients seem to be as good as in the ordinary asylum.

"The three gentlemen who visited the Auburn Asylum in November say:

"'As the general discipline and surroundings of the patients there have improved, the amount of restraint has decreased. In former years harsh treatment, amounting even to the severity of prison discipline, was practiced, and restraint by handcuffs and other means rose to ten per cent. The average has steadily fallen, year by year, since Dr. MacDonald took charge, in 1876, and one may almost predict that its entire discontinuance will soon be the rule.* For sixteen months, we were informed, there had been no escapes, in spite of the remarkable propensity of insane criminals to make attempts. Vigilance is partly the explanation of this long period of immunity, but it is also, and perhaps chiefly, due to the feeling of confidence and goodwill engendered in the patients by the spirit of kindness and trust pervading the asylum. Under the former prison plan of treatment every evil impulse was kept alive, and such patients as were able exhausted the whole strength of their minds in planning escapes.

"'We observed a considerable number of patients out at work, most of them assisting the gardener. Two or three were laying a pavement, one was carpentering, one was assisting the baker, and several others were at work in the laundry, in the engine-house, and kitchen. These men were steady and regular workers, as a rule,

* No form of mechanical restraint has been used since March, 1882.—C. F. M.

and perhaps even better workers than the average of insane men. In the sewing-room we found a discharged criminally insane woman employed as seamstress, and we were told that a criminally insane man had, after recovery, been employed as steward, and had done the work remarkably well. It may be said here that the number of persons taken out to work is necessarily somewhat limited, the garden being so small. With a farm, a large number of patients could be employed to do common work.

"'It might, at first sight, be supposed that the number of feigners would be large in the Auburn Asylum, since its comfort would be favorably commented on among the convicts and lead some to simulate insanity for the purpose of becoming patients. Such is not now the case, since the asylum's reputation for pleasant surroundings is coupled with a reputation for the quick perception and prompt return of the dissemblers to prison. In this connection it may be said that the prison authorities have, *in times past*, taken advantage of the nearness of the asylum to transfer feigners, who would not have been so transferred had the asylum been more remote. This fact appears to offset the apparent advantage which would be found in early transferring from the prison to an asylum close by those convicts really insane whose insanity for some time may escape notice in a prison.'"

Dr. Walter Channing, in a recent article on "Buildings for Insane Criminals,"* says:

"How much may be accomplished by proper treatment may be seen at Auburn, where the worst class of the insane give but comparatively little trouble and are subjected to a minimum of mechanical restraint, and yet are as comfortable and contented as patients in an ordinary hospital for the insane. We find the patients well fed and clothed, and receiving the most thorough medical care; but combined with this treatment there is exercised an amount of disciplinary care, without being obtrusive, which would be impossible in an ordinary hospital. As illustrations of this I may mention the following examples: wearing a uniform dress, which, however, is not *a* uniform;† retiring at 7 P.M., summer and winter; using no tobacco; carrying no knives, and, as a rule, using none at table; being thoroughly searched when entering the wards from out of doors; using no furniture in the room besides a bed, etc. These and other simple regulations the patients readily yield to, and are thereby happier themselves, as well as more manageable. It is but proper to state, in this connection, that the wards of the Auburn Asylum are to-day as bright, and cheerful, and attractive as any I have seen in twenty hospitals, and the diet *better* than is furnished in some State hospitals."

Dr. Kirkbride's Pennsylvania Hospital for the Insane.—The Report of the Pennsylvania Hospital for the Insane, under the able management of Dr. Thomas S. Kirkbride, to whom we are indebted for the report, shows that it began in 1841, with 97 patients, received from the old hospital, which was established in 1752, and that since its opening in 1841 up to 1882, 8480 patients had been received. Of these, 3825 have been restored to their friends cured, 2044 have been discharged in various states of improvement, 1098 left without material improvement, and 1115 died.

The last report, for 1882, shows that at the end of 1881 there were

* Read at the Conference of Charities in Chicago, June 11th, 1879.

† Navy blue sack coat, gray cassimere pants and vest.—C. F. M.

398 patients in the institution. During 1882, 193 patients were admitted, and 183 were discharged or had died, leaving 408 under care at the end of the year. Total number of patients in the hospital during the year was 591. The highest number at any time was 431; the lowest was 385, and the average number 408. There were discharged cured during 1882, 66 patients; much improved, 22; improved, 43; stationary, 29; died, 23. Of the patients discharged "cured," 22 were residents of the hospital not exceeding three months; 24 between three and six months; 13 between six months and one year, and 7 for more than one year. Of the "improved," 16 were under care less than three months; 9 between three and six months; 9 between six months and one year, and 9 for more than one year.

The statistical tables of this institution are peculiarly valuable, as relating to over eight thousand patients, and I therefore give them for their intrinsic value and for the conclusions the profession may draw from their study. I would call especial attention to table viii., showing the supposed cause of insanity. It will be seen that ill-health, intemperance, mental anxiety, grief, loss of friends, etc., the puerperal state, religion, excitement, loss of property, and injuries to the head, rank, in the order in which I have given them, as causes of insanity. Doubtless 90 per cent. of these cases, could they be truly traced, were due primarily to an inherited insane taint. The 3366 cases unascertained would naturally all come under this head.

To the remarks of Dr. Kirkbride, who is one of the most distinguished authorities on mental diseases in this country, I would call the especial attention of the profession.

Statistical Tables.—The tables in this report embrace all the cases received into the hospital since its opening in its present location on the first day of 1841. The number of patients included in the tables given in this report is 8673, and the period of observation is forty-two years.

As every year adds to the number of patients who have been under treatment, so it increases the value of the tables, which are prepared with as much care as possible. Much of the information on which these are based must necessarily come from the statements furnished by the friends of the patients; and, without much caution and a careful cross-examination, there is often a great possibility of being led into error, although it may be unintentionally, upon the reception of a patient. At a later period of treatment, and with a greater familiarity with the case, it is often quite practicable to correct these errors, and to make as near an approach to entire accuracy as possible. Most of the tables are merely statements of facts, about the accuracy of which there can be no question, but there are others that must always be matters of opinion, and the value of which must depend upon the care with which they are made, and the ability of the observer.

TABLE I.—*Showing the number and sex of the admissions and discharges since the opening of the Hospital, and of those remaining at the end of the year.*

	Males.	Females.	Total.
Admissions,	4669	4004	8673
Discharges,	4486	3779	8265
Remain,	183	225	408

TABLE II.—*Showing the ages of 8673 patients at the time of their admission.*

	M.	F.	T.		M.	F.	T.
Under 10 years,	2	3	5	Between 50 and 55,	334	262	596
Between 10 and 15,	15	19	34	" 55 and 60,	225	169	394
" 15 and 20,	237	225	462	" 60 and 65,	166	131	297
" 20 and 25,	636	523	1159	" 65 and 70,	92	81	183
" 25 and 30,	667	617	1284	" 70 and 75,	75	75	150
" 30 and 35,	622	546	1168	" 75 and 80,	31	21	52
" 35 and 40,	662	498	1160	" 80 and 85,	7	12	19
" 40 and 45,	477	454	931	" 85 and 90,	3	1	4
" 45 and 50,	418	356	774	" 90 and 95,	0	1	1

TABLE III.—*Showing the occupation of 4669 male patients.*

Farmers,	496	Insurance Agent,	1
Merchants,	452	Hairdressers,	3
Clerks,	546	Police Officers,	10
Physicians,	103	Machinists,	74
Lawyers,	112	Plane-maker,	1
Clergymen,	57	Iron-masters,	2
Masons,	33	Weavers,	48
Umbrella-makers,	7	Bricklayers,	17
Printers,	51	Brick-makers,	9
Teachers,	56	Sail-makers,	7
Officers of the Army,	10	Coopers,	5
" " Navy,	17	Jewellers,	23
Students,	87	Potters,	3
of Medicine,	23	Chair and Cabinet-makers,	41
of Law,	12	Blacksmiths,	48
of Divinity,	14	Watchmakers,	11
Saddlers,	17	Hotel Keepers,	70
Peddlers,	21	Second-hand dealers,	4
Tobacconists,	30	Cap Manufacturer,	1
Carpenters,	155	Locksmiths,	4
Bakers,	23	Millers,	21
Seamen and Watermen,	76	Glassblowers,	4
Planters,	33	Wheelwrights,	8
Manufacturers,	105	Gardeners,	30
Coachmen,	9	Chemists,	5
Druggists,	44	Print Cutters,	2
Laborers,	338	Curriers,	2
Engineers,	31	Tailors,	49
Plasterers,	20	Shoemakers,	109
Bank Officers,	2	Brokers,	17
Conveyancers,	12	Waiters,	4
Bookbinders,	19	Stove-makers,	3
Hatters,	12	Dentists,	4
Rope-makers,	3	Victuallers,	23
Tinmen,	25	Soldiers U. S. A.,	19
Painters,	40	Brewers,	4
Brush-makers,	3	Coach-trimmers,	2
Paper-hangers,	4	Auctioneers,	3
Boat-builder,	1	Plumbers,	7
Carvers,	4	Type Founders,	3
Confectioners,	14	Telegraph Operators,	7
Coach-makers,	9	Whip-maker,	1
Public Officers,	8	Silversmiths,	3
Shipwrights,	4	Photographer,	1
Collectors,	2	Wire-worker,	1
Nurses,	2	Upholsterers,	4
Soap-maker,	1	Drovers,	6
Contractors,	6	Brass Founder,	1
Authors,	4	Pattern-maker,	1
Editors,	8	Comb-maker,	1
Railroad Conductor,	1	Grocers,	9
Apprentices,	3	Cigar-makers,	2
Musicians,	6	Glove-makers,	3
Coppersmith,	1	Errand boys,	4
Tanners,	8	Engravers,	7
Artists,	25	Electrician,	1
Dyers,	2	Reporters,	3
Gold-beater,	1	No occupation,	685

TABLE IV.—*Showing the occupation of 4004 female patients.*

Seamstresses or Mantua-makers,	342
Storekeepers,	28
Attendants in stores,	35
Cigar-makers,	4
Teachers,	114
Domestics,	354
Nurses,	33
Artists,	5
Factory Girls,	21
Physician,	1
Sister of Charity,	1
Clerks,	9
Actress,	1
School Girls,	3
Hair-dresser,	1
Box-maker,	1
Of the *Single* females, not pursuing a regular occupation, were—	
Daughters of Farmers,	176
" Merchants,	239
" Masons,	4
" Bank Officers,	10
" Weavers,	20
" Laborers,	41
" Sea Captains,	6
" Auctioneer,	1
" Innkeepers,	12
" Teachers,	17
" Carpenters,	23
" Paper-makers,	2
" Physicians,	23
" Planters,	33
" Watchmaker,	1
" Curriers,	3
" Clerks,	42
" Engineers,	3
" Clergymen,	27
" Miller,	1
" Public Officers,	24
" Officers of Army,	2
" " Navy,	1
" Lawyers,	32
" Machinists,	9
" Bricklayers,	2
" Chairmakers,	2
" Manufacturers,	21
" Tailors,	8
" Watermen,	2
" Bakers,	7
" Printers,	11
" Shoemakers,	6
" Druggists,	4
" Artists,	4
" Brick-maker,	1
" Blacksmiths,	2
" Musician,	1
" Dentists,	4
" Tanner,	1
Daughters of Author,	1
" Victuallers,	5
" Saddler,	1
" Coach-makers,	4
" Contractors,	2
" Tinman,	1
" Mason,	1
" Hatters,	2
" Publisher,	1
" Painters,	4
" Glassmakers,	2
" Shipbuilders,	3
" Caterers,	2
" Grocer,	1
Of the *Married*, similarly situated, were—	
Wives of Clerks,	122
" Teachers,	25
" Farmers,	263
" Brass Founders,	4
" Gardeners,	9
" Saddlers,	5
" Printers,	11
" Machinists,	42
" Masons,	7
" Painters,	7
" Stage Owners,	2
" Cutler,	1
" Bank Officers,	16
" Innkeepers,	46
" Bookbinders,	4
" Tinmen,	5
" Editors,	8
" Plasterers,	5
" Engineers,	22
" Artists,	13
" Bricklayers,	2
" Paper-makers,	3
" Collectors,	5
" Brick-makers,	8
" Seamen,	14
" Merchants,	273
" Physicians,	30
" Lawyers and Judges,	59
" Shoemakers,	46
" Hatters,	6
" Cabinet-makers,	20
" Laborers,	229
" Grocers,	12
" Clergymen,	38
" Tobacconists,	12
" Weavers,	21
" Sea Captains,	5
" Victuallers,	12
" Brush-makers,	2
" Tailors,	32
" Millers,	12
" Police Officers,	11
" Carpenters,	57

TABLE IV.—*Continued.*

Wives of	Druggists,	16	*Widows* of	Shoemakers,	27
"	Huckster,	1	"	Clergymen,	7
"	Planters,	15	"	Farmers,	72
"	Paper-hanger,	1	"	Coopers,	3
"	Ship-builder,	1	"	Laborers,	44
"	Livery-keeper,	1	"	Manufacturers,	16
"	Peddlers,	8	"	Lawyers,	12
"	Coachmen,	4	"	Carpenters,	8
"	Manufacturers,	74	"	Clerks,	19
"	Brokers,	5	"	Tanners,	2
"	Tanners,	14	"	Teachers,	2
"	Musicians,	4	"	Planters,	6
"	Conveyancers,	8	"	Bricklayers,	3
"	Officers of Army,	13	"	Painters,	3
"	" Navy,	4	"	Seamen,	9
"	Plumbers,	3	"	Engravers,	2
"	Blacksmiths,	17	"	Engineers,	7
"	Bakers,	6	"	Machinists,	6
"	Waiters,	3	"	Masons,	2
"	Confectioners,	4	"	Printer,	1
"	Hairdressers,	2	"	Blacksmiths,	3
"	Contractors,	7	"	Bakers,	5
"	R.R. Conductors,	9	"	Druggists,	4
"	Dentists,	6	"	Musician,	1
"	Watchmakers,	6	"	Interpreter,	1
"	Public Officers,	17	"	Tailor,	1
"	Brewers,	4	"	Dentists,	2
"	Optician,	1	"	Tinman,	1
"	Ironmasters,	3	"	Confectioner,	1
"	Perfumer,	1	"	Silversmith,	1
"	Gold-beater,	1	"	Barber,	1
"	Jewellers,	2	"	Brickmaker,	1
"	Architect,	1	"	Coachman,	1
			"	Carriagemakers,	2
Of the *Widows*, similarly situated, were—			"	Army Officer,	1
			"	Plasterer,	1
Widows of	Merchants,	78	"	Tobacconist,	1
"	Physicians,	17	"	Weaver,	1
"	Public Officers,	12	"	Contractor,	1
"	Sea Captains,	8	"	Conveyancer,	1
"	Hotel Keepers,	6	"	Peddler,	1

TABLE V.—*Showing the number of single, married, widows, and widowers in 8673 patients.*

	Males.	Females.	Total.
Single,	2272	1645	3917
Married,	2150	1866	4016
Widows,	. . .	493	493
Widowers,	247	. . .	247

TABLE VI.—*Showing the nativity of 8673 patients.*

Natives of	Pennsylvania,	4622	
"	New Jersey,	393	
"	Delaware,	209	
"	Maryland,	253	
"	Virginia,	113	
"	North Carolina,	73	
"	South Carolina,	61	
"	Georgia,	40	
"	Alabama,	19	
"	Tennessee,	31	
"	Indiana,	15	
"	Kentucky,	40	
"	Dist. of Columbia,	24	
"	Maine,	22	
"	Massachusetts,	99	
"	Connecticut,	49	
"	Missouri,	20	
"	Ohio,	64	
"	New Hampshire,	14	
"	Louisiana,	26	
"	Rhode Island,	17	
"	New York,	288	
"	Mississippi,	14	
"	Vermont,	7	
"	West Virginia,	6	
"	Michigan,	4	
"	Iowa,	3	
"	Texas,	5	
"	Illinois,	14	
"	Florida,	5	
"	Wisconsin,	4	
"	Sicily,	1	
"	Nova Scotia,	2	
"	Canada,	19	
"	France,	27	
"	England,	348	
Natives of	Scotland,	56	
"	Ireland,	1079	
"	Germany,	465	
"	Poland,	10	
"	Prussia,	18	
"	Switzerland,	10	
"	Bermuda, W. I.,	3	
"	Jamaica, "	2	
"	St. Domingo, "	4	
"	Barbadoes, "	4	
"	Cuba, "	18	
"	Guadaloupe, "	1	
"	Martinique, "	1	
"	St. Croix, "	1	
"	St. Thomas, "	3	
"	Island of Madeira,	1	
"	Isle of Man,	1	
"	Spain,	3	
"	Italy,	6	
"	Denmark,	4	
"	Holland,	5	
"	Russia,	1	
"	Austria,	6	
"	Bavaria,	4	
"	Venezuela, S. A.,	1	
"	Norway,	1	
"	Japan,	1	
"	Costa Rica,	2	
"	St. Kitts,	2	
"	Mexico,	1	
"	Brazil,	2	
"	Belgium,	1	
"	Buenos Ayres,	1	
"	China,	1	
"	Ceylon,	1	
Born at sea,		1	

TABLE VII.—*Showing the residence of 8673 patients.*

Residents of	Pennsylvania,	7052	
"	New Jersey,	304	
"	Delaware,	192	
"	Maryland,	192	
"	Virginia,	78	
"	West Virginia,	9	
"	Dist. of Columbia,	41	
"	North Carolina,	67	
"	South Carolina,	37	
"	Georgia,	39	
"	Alabama,	23	
"	Louisiana,	47	
"	Tennessee,	22	
"	Kentucky,	25	
"	Arkansas,	4	
"	Mississippi,	15	
"	Vermont,	5	
"	Texas,	14	
"	Illinois,	28	
"	Michigan,	10	
"	Ohio,	61	
"	Indiana,	18	
"	Missouri,	33	
"	Massachusetts,	24	
"	New Hampshire,	1	
"	Iowa,	9	
"	Connecticut,	16	
"	Maine,	3	
"	Rhode Island,	8	
Residents of	New York,	207	
"	Florida,	6	
"	Wisconsin,	3	
"	California,	5	
"	Oregon,	1	
"	Minnesota,	4	
"	Kansas,	5	
"	Montana,	2	
"	Colorado,	2	
"	Nebraska,	1	
"	Jamaica, W. I.,	2	
"	Barbadoes, "	4	
"	Cuba, "	14	
"	St. Croix, "	1	
"	St. Thomas, "	4	
"	Island of Madeira,	1	
"	Germany,	3	
"	Venezuela, S. A.,	2	
"	England,	7	
"	Norway,	2	
"	Costa Rica,	2	
"	Mexico,	3	
"	Canada,	9	
"	Japan,	1	
"	Nova Scotia,	1	
"	Brazil,	2	
"	Italy,	1	
"	Sandwich Islands,	1	

TABLE VIII.—*Showing the supposed causes of insanity in 8673 cases.*

	M.	F.	T.		M.	F.	T.
Ill health of various kinds,	864	746	1610	Celibacy,	1	...	1
Intemperance,	798	65	863	Anxiety for wealth,	3	...	3
Loss of property,	233	55	288	Use of opium,	14	21	35
Dread of poverty,	4	3	7	Use of tobacco,	15	2	17
Disappointed affections,	33	68	101	Lead poisoning,	1	...	1
Intense study,	41	13	54	Use of quack medicines,	2	2	4
Domestic difficulties,	53	120	173	Puerperal state,	...	319	319
Fright,	20	55	75	Lactation too long continued,	...	14	14
Grief, loss of friends, etc.,	90	314	404	Uncontrolled passion,	5	8	13
Intense application to business,	73	19	92	Tight-lacing,	...	1	1
Religious excitement,	96	147	243	Injuries of the head,	116	7	123
Political excitement,	14	...	14	Masturbation,	96	5	101
Metaphysical speculations,	1	...	1	Mental anxiety,	193	334	527
Want of exercise,	6	2	8	Exposure to cold,	5	1	6
Engagement in duel,	1	...	1	Exposure to direct rays of the sun,	79	3	82
Disappointed expectat'ns,	14	22	36	Exposure to intense heat,	1	1	2
Nostalgia,	...	10	10	Exposure in army,	8	...	8
Stock speculations,	2	...	2	Old age,	...	7	7
Violent boating exercise,	1	...	1	Sudden acquisition of wealth,	1	...	1
Want of employment,	53	3	56	Unascertained,	1730	1636	3366
Mortified pride,	2	1	3				

TABLE IX.—*Showing the ages at which insanity first appeared in 8673 patients.*

	M.	F.	T.		M.	F.	T.
Under 10 years,	21	6	27	Between 50 and 55,	232	199	431
Between 10 and 15,	73	72	145	" 55 and 60,	163	138	301
" 15 and 20,	447	375	822	" 60 and 65,	116	87	203
" 20 and 25,	801	705	1506	" 65 and 70,	55	37	92
" 25 and 30,	809	703	1512	" 70 and 75,	30	28	58
" 30 and 35,	574	552	1126	" 75 and 80,	16	9	25
" 35 and 40,	582	426	1008	" 80 and 85,	3	10	13
" 40 and 45,	418	384	802	" 85 and 90,	1	...	1
" 45 and 50,	328	273	601				

TABLE X.—*Showing the forms of disease for which 8673 patients were admitted.*

	Males.	Females	Total.
Mania,	1996	1899	3895
Melancholia,	1063	1321	2384
Monomania,	705	447	1152
Dementia,	890	332	1222
Delirium,	15	5	20

TABLE XI.—*Showing the duration of the disease at the time of admission in 8673 patients.*

	Males.	Females	Total.
Not exceeding 3 months, ...	2039	2173	4212
Between 3 and 6 months, ...	404	339	743
" 6 months and one year, ...	596	467	1063
" 1 and 2 years, ...	640	396	1036
" 2 and 3 "	324	181	505
" 3 and 4 "	179	110	289
" 4 and 5 "	109	73	182
" 5 and 10 "	201	142	343
" 10 and 15 "	75	57	132
" 15 and 20 "	34	30	64
" 20 and 25 "	34	17	51
" 25 and 30 "	16	10	26
" 30 and 35 "	7	5	12
" 35 and 40 "	5	. . .	5
" 40 and 45 "	4	3	7
" 45 and 50 "	1	1	2
" 55 and 60 "	1	. . .	1

TABLE XII.—*Showing the number of the attack in 8673 cases.*

	M.	F.	T.	In the *periodical* cases,	M.	F.	T.
First attack, .	3453	2820	6273	10th 10 m. 7 f., 11th 5 m. 4 f., .	15	11	26
Second " .	677	713	1390	12th 4 m. 3 f., 13th 3 m. 2 f., .	7	5	12
Third " .	212	249	461	14th 3 m. 3 f., 15th 1 m. 1 f., .	4	4	8
Fourth " .	115	95	210	16th 1 m., 17th 2 m., . . .	3	. . .	3
Fifth " .	53	52	105	18th 4 m., 19th 2 m., . . .	6	. . .	6
Sixth " .	66	19	85	20th and 21st each 1 m. and 1 f.,	2	2	4
Seventh " .	32	7	29	22d 1 m., and to 26th each 1 f., .	1	5	6
Eighth " .	14	10	24	27th 2 f., 29th 1 f., . . .	. . .	3	3
Ninth " .	9	5	14	30th, 31st, 32d, 33d, each 1 f., .	. . .	4	4

TABLE XIII.—*Showing the state of 8265 patients who have been discharged or died—their sex, and the forms of disease for which they were admitted.*

	Males.	Females.	Total.	Mania.	Melancholia.	Monomania.	Dementia.	Delirium.
Cured, . . .	1975	1916	3891	2157	1077	537	117	3
Much improved, . .	262	400	662	277	249	92	44	. . .
Improved, . . .	817	630	1447	503	427	256	261	. . .
Stationary, . . .	771	356	1127	369	265	138	354	1
Died, ...	661	477	1138	479	241	45	357	16

TABLE XIV.—*Showing the number of admissions, discharges, cures, and deaths in each month since the opening of the hospital.*

	Admissions.	Discharges.	Cures.	Deaths.
1st month,	679	743	309	109
2d "	645	524	249	84
3d "	766	614	280	90
4th "	855	635	294	103
5th "	874	744	341	110
6th "	829	705	333	72
7th "	728	782	371	102
8th "	687	728	341	115
9th "	660	716	346	97
10th "	680	737	373	89
11th "	637	678	320	83
12th "	632	659	334	84

Evening Entertainments.—Occupation and Amusement of the Patients.—The year just closed has made a record quite equal to any of its predecessors in regard to the matters coming under the heading of this section of the report for 1882. None of the old modes of amusement, occupation, or evening entertainments have been abandoned or lessened in frequency, while several new ones have been introduced, to the great gratification of those for whose benefit they were originally provided. This year, it may be said, with some allowable pride, is the fourteenth, during which, at one department, there has not been the omission of a single evening, and almost the same is true of the other, during the nine months which have always been regarded as the extent of the regular course. Beyond the fact of this work having been done, it is pleasant to know that, with very few exceptions, there has been a general recognition of its value, and that its performance has been regarded as involving no more labor than that of carrying out the most ordinary daily duties of the institution. At the department for males all the varieties of active outdoor exercise, and the different games heretofore used, have been steadily resorted to, while within doors everything has been introduced that seemed to be available and likely to make a stay in the hospital less irksome. At the department for females, besides all the customary modes of occupation and amusement, special sewing-classes have been introduced by ladies who were here for the benefit of their own health, and in a manner which has given particular interest to them, among their fellow-patients.

The modelling in clay, under the direction of J. Liberty Tadd, has been a very successful experiment, and some of the products of that workroom have been most satisfactorily successful. Those who have taken instruction in oil-painting, under the direction of the same able artist, have also shown the value of all of this class of occupations, and some patients have developed a capacity for that kind of work that had not been supposed to exist. In summer the successful cultivation of flowers by the ladies in the garden placed under their immediate control, was very satisfactory, and a source of great pleasure to those who have thus spent hours of many days in this form of employment in the open air.

To the ladies who originated all of these forms of occupation, and whose zealous prosecution of them induced so many to unite with them in these pleasant modes of passing the time, we feel under great obligation for the good results of their intelligent suggestions and active participation in the work.

There has been a steady effort to increase the amount of time spent in the open air, and in suitable exercise, by all patients whose physical condition would enable them to work,

ride, or walk. The kindness of our friends has increased the number of our vehicles for riding, and we hope that the number of suitable horses and ponies will also be made greater from the same source, while our roads, we trust, will gradually be made just as good as their proper construction can make them.

A small gift from a friend for the special purpose, enabled us to make a beginning of having music on the lawns in the summer afternoons, or in the evenings during the officers' tea parties, and which gave so much pleasure to the large number who were thus enabled to have this enjoyment while in the open air, that it is hoped hereafter there will be a material extension of this mode of passing a portion of the summer days, when the patients generally can be out of doors and get equal benefit from it.

To those not familiar with the ordinary routine of our evening entertainments, it may be mentioned that they embrace, besides whatever novelties we can secure, lectures, readings, concerts, exhibitions of very fine dissolving views, gymnastic exercises, officers' tea parties once a week during the entire year, and whatever else our means and the kindness of our friends may place at our disposal.

Dr. Kirkbride's remarks on the necessity for prompt treatment are especially valuable, and are as follows:

While there are so many causes for feelings of gratification at what has been done, it must be acknowledged that there is abundant evidence of losses sustained by a neglect to adopt a prompt course of judicious management for those who are suffering from forms of mental disease, that when neglected, are pretty sure—sooner or later—to lead to results of the most melancholy character. It is certain, too, that while so many of the insane are permitted to wander at large, unprotected and uncared for, there will be not only a steadily increasing list of incurable patients, but there will also be a daily record of melancholy events, which a rational course of care would, probably, have prevented. As long ago as twenty-seven years, after careful observation, the writer of this report ascertained that, in a particular year, the number of persons whose lives were sacrificed or jeopardized by the insane, who were allowed to be at large, in the United States, was equal to those lost by all its railroad accidents. Since that time the extension of railroads has made the accidents connected with them undoubtedly increase in a greater ratio than those that have come from the course of persons responsible for the care of the insane, but neglectful of their obvious duties; but even now, any one who will read for a short time the regular daily summaries of such occurrences, and of the accidents throughout the country that may be found in some of our newspapers, will be astounded not only at their number, but at the horrible character of many such events detailed there. Among these, it is hardly necessary to say, are intended to be included a large proportion of the cases of suicide, which are clearly the results of disease, and which, with proper care, would have been prevented and in all human probability these unfortunates would have been restored to their families, relieved of this dreadful propensity.

A general knowledge in the community of facts like these, as well as of the risks of delaying treatment till the probable period of its being successful has passed, would lead those having control of families to seek early counsel from their medical advisers on the occurrence of symptoms of mental aberration, and these could not fail to feel the responsibility of promptly adopting the only course that is likely to give protection equally to patients, their families, and the community.

It has been common to urge, in documents coming from this institution, not only the importance of a more thorough study of mental diseases in the medical schools,—

because it is, in a large majority of cases, from the family physician that counsel is first asked on the indication of such a trouble,—but also, that in colleges and all the higher institutions of learning, as well as in ordinary schools, there should be taught at least a general idea of the functions of the brain, the courses of life likely to lead to their disturbance, as well as those that would probably maintain them in their integrity, some of the indications of commencing disorder, the importance of prompt treatment, and especially of steady perseverance in it, under wise counsel, when once undertaken.

If such knowledge were generally diffused, it would be not only directly advantageous to those who are suffering from mental disorders, but it would put an effectual check to the extravagant plans constantly urged upon the attention of legislatures, not only in regard to the construction of hospitals, but to their government and to various details, which properly can only be left to the executive authorities of such institutions. Legislators, then, would have no difficulty in deciding for themselves on the pretensions of those whose schemes have nothing but novelty for their recommendation, and which are opposed by the results of all careful experience.

No one who has had much to do with giving counsel to those who have had their dearest friends threatened with this class of disorders, or who are themselves actually sufferers from some form of them, but must have recognized how much distress would have been saved to all concerned, by a very moderate amount of such sound knowledge of the malady as has been referred to, as well as a general idea of the kind of treatment in hospitals, that to be successful, is often unavoidable, and some of the reasons for its adoption.

There is a picture constantly to be met with where individuals with more than the average mental intelligence and a general familiarity with ordinary topics and business, come for counsel, with feelings of depression and utter hopelessness far beyond what are commonly connected with the occurrence of any ordinary malady. Acknowledging a profound ignorance of the whole subject, the declaration is made that the existence of such a trouble is wholly unaccountable, no one in the family having ever suffered from any mental disorder, and, while prepared to make every sacrifice to secure the restoration of the patient, before doing so they very properly desire some explanation of the nature of the disease, the chances of a recovery, and the reasons for plans of treatment so different from what are commonly adopted in the management of ordinary sickness.

Then come the dread of leaving home and losing all the kind attentions there commonly given, dislike to the idea of entering an institution of the character of which little is known, and where it is supposed all classes of invalids are mingled together; and all this is accompanied by an utter inability to comprehend how, under any classification, one person with a disordered mind can fail to be of disadvantage to another if living in the same building, no matter how extensive it may be or how complete may be the arrangements for a thorough separation of the different classes of patients.

To those who have such impressions and such a want of knowledge on the entire subject, it can only be answered that insanity is a disease from which no one, under certain circumstances, can claim exemption; that if no individual belonging to a family has ever had such a form of sickness it is only a matter for profound gratitude, and that such a degree of permanent good fortune can hardly be expected to continue indefinitely.

By many heredity is regarded as the prevalent cause for the development of mental disorders, and that without it there is little danger of its occurrence. Although hereditary influence is often an important element in the production of mental, as of other diseases, still the extent of it has unquestionably been often greatly exaggerated. That this is so may reasonably be inferred from the fact that of the first 5381 cases suffering from a

primary attack of insanity admitted here, there were only 434 in whom there could be traced any hereditary influence worthy of record.

It should be a comfort, too, for such inquirers to be assured, as our experience here fully justifies us in saying, that where simple, uncomplicated cases of insanity are properly and promptly treated, and the treatment duly persevered in, they are just as curable as are other ordinary serious disorders, and that when entirely cured, where a thorough obedience to natural laws and common sense are subsequently observed, there is no more reason to anticipate a return of the disease than there would be in other maladies under similar circumstances.

The day should now be passed when any one of intelligence and cultivation should regard it as a reproach to have suffered from impairment of health and to have resorted for treatment to an institution, without which course, there was good ground to believe, the chances of restoration would have been greatly diminished. As there could be no reproach in suffering from an illness for which there was no responsibility, so, very clearly, there could not be in taking advantage of every means for the restoration of one's health that the most widely-extended experience had given reason to believe would be successful.

Beyond this, if it were wanted to discover those who had been sufferers from this class of affections and had been restored to health and usefulness through hospital treatment, there need be no difficulty in finding such among the best and most cultivated men and women of the land, and whose hospital experiences had rendered them prepared for a wider degree of enlightened usefulness than they could otherwise have possessed.

Another important result of careful investigation that should always be given to those who are seeking information on the subject is that universal experience has shown that the most important elements for securing a restoration to health are the prompt resort to an intelligent course of treatment and a steady persistence in it till the complete recovery of the patient. While they may be assured that it is not necessary that every person who is suffering with an unsound mind should leave home for treatment, there can be no question but that the general experience is positive that, for a very large number of those who are thus affected, this is a painful necessity, and must be joined to the patient's being placed under the care of those who have made a special study of the whole subject, strangers though they are likely to be, if it is desired to give them the best chances for a restoration.

So, when they plead for a mode of care in their homes and with their families, they are to be reminded that "home treatment" and "family care," with all the kind attentions which are connected with such a mode of providing for the unsound of mind, have almost always been tried and have failed before the removal from home is even brought up for consideration. So, too, as among the results of the disease itself, they need hardly to be told, is often found an utter want of appreciation of the kindest attentions from the dearest of friends, and all the blessings of home and its surroundings are as likely as not to be completely ignored or not appreciated. It may also be asked why, when no hesitation is felt in leaving home to secure perfect rest, and change of scene, climate, and occupation, when these have been found beneficial in other maladies, those who suffer from mental illness should not avail themselves of any change, although different in kind, which rarely involves such an expenditure of means, risk, and anxiety, and the results of which have been found to be at least as favorable by an almost universal experience

Many of those who thus come for counsel have never even seen the interior of a hospital, and have derived most of their ideas in regard to such institutions, not only of their management but their construction, from works of fiction or the sensational articles so often found in certain portions of the public press, bringing, therefore, with them preju-

dices of the most extravagant kind. Before such as these are allowed to decide upon placing their friends under the care of an institution, they should be shown through the different parts of the building, have its arrangements explained, and be enabled to see for themselves that the patients are classified so as to do most good, or, at any rate, the least possible harm, to each other, and that this mode of separation may be made almost as complete as that of families living in contiguous buildings of a square in a city, where all are liable to meet in their walks in the streets or in the parks, at places of amusement, lectures, or religious services, but not otherwise unless voluntarily.

In regard to entering hospitals, it is, indeed, a matter of surprise that patients are often so far in advance of their families and friends in indicating the proper course to be pursued on the occurrence of a case of insanity, and, after recovery, there is nothing more pleasant than, as is often the case, to have those who have been so fortunate as to secure this result from hospital care, ask that, should they ever have a recurrence of the disease, they should be again promptly placed under the same form of treatment.

Report of Statistics of the Hartford Retreat for the Insane, Hartford, Conn.—The Fifty-ninth Annual Report of the Retreat for the Insane at Hartford, Conn., for which we are indebted to Dr. Henry P. Stearns, the superintendent, shows: that on the 31st day of March, 1882, the whole number in the Retreat was 122,—58 men and 64 women. There were 78 admissions during the year. There were 74 discharges and 9 deaths. The whole number under treatment during 1882 was 200; there were discharged recovered, 26; much improved, 11; improved, 6; stationary, 22; died, 9; remaining at end of the year, 126. Since April 1st, 1844, there have been admitted 641 patients between 20 and 25 years of age, 647 patients between 25 and 30 years of age, 650 patients between 30 and 35 years of age, 603 patients between 35 and 40 years of age, 553 patients between 40 and 45 years of age, and 434 patients between 45 and 50 years of age. "From this period of life," says Dr. Stearns, "the number rapidly diminish, and there have been only 150 persons admitted during the whole thirty-eight years who were known to be over seventy years of age; and only 316 below twenty. It thus appears, so far as these statistics of the Retreat are evidence, that there exists a considerably uniform average as to the ages of persons who become insane from twenty up to forty or fifty years, and that a larger number are affected between twenty and forty, and also during any number of these years than there are during any equal number at other periods of life. It will be observed that these are the periods during which the brain comes into its largest activity and responsibility. The individual no longer enjoys the support and protection of the parental home; his relations to society and the public then become more fully declared, and his business cares and anxieties greater; besides there

exists a larger measure of uncertainty as to success and failure in all the avocations and employments of life than is the case either earlier or later. It is during this period that such habits and customs of life as are unfavorable to the continuance of mental integrity are usually formed and more fully take possession of the individual, especially in relation to the passions and the use of alcohol and tobacco. Moreover, it is at this time that failures in business, disappointments in relation to plans and purposes, and anxieties in relation to children and the support of families are generally greater than at other periods. Especially is this the case with those classes (already large in this country, and yearly becoming larger) which have never thoroughly learned any trade or employment, and are obliged to depend on doing so while employed for wages. Such conditions of life and experiences, together with a larger measure of brain-susceptibility and activity than exists later in life, are some of the causes why insanity affects a larger number of persons between twenty and forty than between forty and sixty years of age. After forty the brain is less sensitive to external influences and occupations; the relations of the individual to society and occupations are generally settled, and he is much less liable to be affected by failure or success in the pursuits of life than he is at a younger age."

Dr. Stearns further says: "In my report for 1876, I presented some statistics from the history of recoveries in the Retreat since its opening to the year 1875, and showed that there had been a somewhat uniform diminution in the percentage of recoveries up to that time, and reiterated a previously-expressed opinion that the nature of the causes of insanity were becoming somewhat changed or intensified, so that insanity is less curable than it was during the early history of the Retreat. Since that time the whole subject of the curability of insanity has been treated in a very thorough manner by Dr. Pliny Earle in several of his yearly reports, and the conclusions at which he arrives tend strongly to confirm the opinion then advanced."

Statistics of the McLean Asylum for the Insane, Somerville, Mass., Department of Massachusetts General Hospital.—The sixty-fifth annual report of this institution, for which we are indebted to Dr. Edward Cowles, the medical superintendent, shows: that there were in this asylum, January 1st, 1882, 155 patients,—63 men and 92 females. The admissions for 1882 were 82 in number. The whole number of *cases* within the year, 237; discharged recovered, 26; much improved,

7; improved, 14; unimproved, 15; deaths, 8; patients remaining December 31st, 1882, 167. During the year no person was twice admitted. The average duration, from the beginning of attack, of all persons recovered was 10.54 months, and the average duration of their hospital residence was 8.86 months. The percentage of recoveries on admissions was 30.48. The number of recoveries was larger by five than in any year since 1870. Dr. Cowles has some excellent remarks respecting the care of the insane, which we insert as follows:

There has, of late, been much discussion of the question of the curability of insanity; and the results of the treatment of the insane in large and well-managed hospitals, like those in Massachusetts, are still disappointing as compared with results reported to be gained in the early days of the older and smaller hospitals. A reduction from 75 per cent. to 20 per cent. of recoveries is perhaps due to something more than the errors of the older statistics. It is probably true that the majority of the insane can be best and most practicably treated away from their homes and in hospitals, and these are not yet accomplishing what has been hoped of them in curative results. Instead, however, of treating this fact in terms of reproach, it should not be forgotten that mental disease involves the disorder of an organ of a highly complex and delicate structure, and comparisons between its diseases and those of other organs of the body should not be drawn unfairly. It has its own physiological and pathological laws; and, at the best, its diseases may have to be regarded as largely incurable. The fact that the insane are treated mostly in hospitals and become burdens upon the State gives them prominence, because of their economic relations. Let us suppose that tubercular diseases are to be regarded as infectious, and their subjects are to be put into hospitals. What public alarm would be aroused by the great number and fatality of cases of this disease, now unrealized, or by the burden of the care of its chronic forms; and how soon would it become the fashion to reproach those who treat it because of its incurability?

The insane must be cared for with due regard to public and private economy, and the system now common to all civilized countries of collecting them in large hospitals is held to be on trial. It is, at all events, imperative that no possible effort should be spared to get curative results from the treatment of the insane. Curability certainly diminishes with duration of mental disease, and its earliest stages should be most thoroughly studied and treated. The smaller hospitals are endowed with greater facilities for individualizing cases, and for treatment; and, therefore, a great responsibility lies with them for making the best use of those facilities. They should encourage the admission of acute cases, and devote their best energies to their study and care. It seems to me that in such hospitals, where the means and the opportunity are liberally given, while due regard is to be had to a proper conservatism, it is a special duty to explore new paths, if any there be, beyond the beaten ways of procedure in the management of the insane. To stand still is to fail, when progress is demanded and is possible; for even negative results are valuable. It is also a duty to report experiments for the later tests of criticism and experience, and hence this may be deemed a fitting time and place for putting on record some of the results of the study of the problems of hospital management in this asylum during the past three years.

Developing a homelike aspect of the hospital, destroying the suggestion of insanity as differing from other diseases, individualizing the patients, and perfecting the conditions for moral treatment are of prime importance. The truth goes further, and includes

the essential fact that we are treating sick people, and are, after all, dealing with a hospital.

One of the first considerations, therefore, was the quality of the nursing of the sick. The aim has been to introduce the best methods of the general hospitals, by promoting the growth of the spirit that prompts devotion to the sick; requiring constant personal attention to them as individuals, by companionship as well as nursing; introducing ward-maids to perform duties that distract the attention of nurses from more important ones; increasing the number of nurses on duty at night, so that most of the patients can have the doors of their rooms unlocked, and all noteworthy events can be observed and systematically reported; employing experienced night supervisors to see that all medical directions are properly carried out, and that everything is done to promote the comfort and cure of the sick; in short, by providing a service qualified for the task of treating a houseful of acute cases. This is the beginning of what it is believed can be accomplished as the result of the recent employment of a superintendent of nurses, and of a systematic course of training and instruction which is to be adopted for them. To one who has employed in hospital wards intelligent and well-trained nurses who have an interest in their work as a profession, their value in the companionship as well as the care and treatment of the insane needs no commendation.

In the direction of developing the hospital element of the work, the employment of an ample medical staff has given increased satisfaction during the past year. An assistant physician for each service, male and female, is a liberal allowance for a total of one hundred and seventy patients; but, in an asylum of this kind, much attention must, or can well be bestowed upon individuals. The continued employment of a house-pupil for each service, to do the work of clinical clerks, as in general hospitals, is a valuable addition to the organization. It is understood that the time thus gained by the assistant physicians from clerical and other duty shall be employed in professional work. And, to facilitate this, a room has been fitted up for a laboratory and the use of the microscope; and a systematic course of study, begun a year ago, is now going on under the direction of Dr. Gannett, of Boston, who is also employed as the pathologist of the asylum.

Moral Treatment.—A consideration of the moral treatment of insanity of course leads over ground that is not new, but it may be permitted to restate a few propositions. It is important, at the outset, to establish the principle which shall serve as a basis for the moral treatment of the insane person as an individual. The underlying principle in the whole matter is, that the patient should be treated as a reasoning being. In other words, from the moment he enters the hospital, it should be assumed that he will understand more or less correctly all that is said or done to him. Therefore, he should be treated as if he were expected to act rationally, and led to see that, after his failure to do what is expected of him, he brings upon himself friendly advice, criticism, reproof, and, if need be, restriction. On the part of others, while the attitude toward him of physicians and nurses should be as toward a rational man, the fact of his illness and mental obscuration should be kept in view; and the conditions of his daily life should be made easy by conforming them as nearly as possible to those of his ordinary experience. His clouded and perverted understanding should be given as few unaccustomed problems for comprehension as possible in his new mode of life in the hospital.

The physiological basis of all moral treatment of the insane is the fact that the normal functions of the cerebral organ may be only temporarily disturbed or only partially impaired, whether by temporary disorder or pathological change, and the consequent fact that in most cases some degree of normal function remains. This principle cannot be better stated than by Dr. Gairdner, in his presidential address to the British Medico-Psychological Association last August. Speaking of the improved treatment of the insane,

begun in the time of Pinel and Tuke, he says it has gradually come to be regarded as the truth that "the unsound mind, like the unsound body, can only be regarded as an instance of disordered function; and that, however great the disorder, the functions are still there, and may be roused into more or less healthy activity by exactly the same physiological stimuli as are available in the state of health." He would name as the most important gain of modern physiology and pathology for the healing art, the modern conception or theory of disease,—that "disease is, for the most part, normal function acting under abnormal conditions." He argues, therefore, that the insane mind is not *aliena mens*, but has like passions and emotions with the sound mind; and that the sound elements still remaining must be carefully respected, strengthened, and built up again, if possible.

All moral treatment, then, should be addresssd to the purpose of calling into normal exercise the rational part of the disordered mind. The patient should be assumed to be capable of some degree of understanding of the fact that he is ill; and all the conduct of others towards him should frankly and consistently declare this, before as well as after his entering the hospital. The fact should be made as plain as possible to him that his commitment by the court is according to law, and based upon medical opinion outside of the hospital. There are few patients who cannnot be beneficially impressed in this way, however much they may contest the correctness of the judgment upon them.

Once within the hospital, the conduct of physicians and nurses toward the patient should show that he is regarded as simply ill, and as having no reason for being ashamed of his illness. Therefore, he should always be called a "patient," and not a "boarder," as is the custom in some hospitals, and has been in this one from its earliest days. This latter term implies an evasion of the fact of illness, as if it were a disgrace, and by a euphemism fosters the very feeling of which we are trying to disabuse the patient. Dr. Kirkbride has pointed out the same effect as inherent in the use of the word "asylum" for "hospital."

For the same reason, the word "attendant" is unfortunate, although it is so much better than the older term, "keeper." It would be only the truth to call them "nurses." While everything should be done to make the place homelike and cheerful, with pleasant parlors, books, pictures, music, diversion, and occupation suited to the individual, the idea of the hospital is in it all, and no attempt should be made to ignore it. It should appear rather that active attention is being given to the business of curing the sick. "Attendants" may attend the infirm and incurable; but "nurses" attend the sick, and the experience of recovery from illness is so common that the very idea of the presence of a nurse logically carries with it the other idea that something is being done to promote recovery, and that itself inspires hope and is curative. The keynote of all that is addressed to the patient on this subject should be, "You are ill; you may get well."

In practically working out the general principle that has been stated, it is believed that successful results have also been gained in two other experiments during the past three years.

One of these is the employment of female nurses in men's wards, as described in my report of last year. For the majority of insane men this is practicable; and every day's experience with it teaches me to prize more highly its value. To put a man accustomed to the comforts, or even if no more than to the habits, of domestic life, into a restricted association with men, would be to him an experience of which he probably has had no previous conception. Such a way of living would be unnatural and unattractive to most men, and to the sick man, whose mind is already disturbed, a cause of added discomfort. In such an association of men alone the inevitable tendency is to degenerate in manner of speech and conduct; and this is true, both of the patients and what is very important,

of the men nurses also. There is something lacking after all efforts to make the wards homelike and agreeable.

The presence of female nurses in most of the wards, and of young women as ward-maids, is as easily managed as in the wards of a general hospital. Although some of the conditions differ, there is much to prove the practicability of this in ordinary hospitals, in the successful management of all the men's wards of the Mount Hope Retreat at Baltimore by the Sisters of Charity. The insane man coming into such a ward is restrained and softened, and practices instinctively a degree of self-control that he would not have thought of trying to exercise in the presence of men alone. His first impressions upon entering the asylum are far more agreeable than in the former case and continue so. The special qualifications of women for the care of the wards and the sick are of great value, and the moral and curative influence of their habitual presence in our wards for men is positive and would not be willingly given up. The good results that have followed this practice flow directly from its influence in stimulating the exercise of the remaining sound elements of the mind, and of healthy and decent habits of thought and conduct.

The other experiment, which is believed to have given some special and good results, is in regard to the freedom of communication between patients and their relatives or friends, by visiting or correspondence. It is now two and a half years since my former liberal practice grew into the adoption of the present rule for the following reasons. Few of the insane have their understandings so confused and clouded as not to leave enough of normal mental function to conceive of the reasonableness of removing a sick person to a hospital. There is often on the part of persons so removed a consciousness of the propriety of this action, even in those who will not confess it. Even in cases of maniacal excitement and melancholia with stupor, we may rely upon being able to instil into the mind some degree of consciousness of the true nature of the act of removal to a hospital. When, however, we come to abruptly separate the insane person from all communication with relatives and friends, we institute a condition of things which is the more difficult to understand as the patient is more insane. The patient probably knows the usual fact, that the distance is not great from home and friends. Enforced separation and interdiction of communication beget suspicion of those friends, if it has not been entertained before, or of the physicians of the hospital. It is of the first importance not to increase or arouse this suspicion, and to convince the patient of the desire to treat him with generous fairness and indulgence. Therefore the rule is that, from the outset, the relatives or friends shall be allowed to visit the patient. Care is taken to have it understood by all concerned that the physician will see no objection to such visiting *until the patient shall give cause for it.*

This is the *rule;* but, like all rules, it has its exceptions. The patient who has an antipathy and delusion regarding relatives might not be allowed to receive visits for some time after the first one, or even the first might be denied; but it is remarkable how few patients there are who require this restriction. In this asylum, of one hundred and sixty-seven patients present, there are only three who do not receive visits from relatives quite regularly. One man with chronic mania refuses to see them because of a violent antipathy; and the relatives of the two other men with mania have to refrain from visiting on their own account, but visits are made by friends. It has been observed that if excitement attends the first visit, which should be made early, it is as a rule no greater than attended contact with friends at the home recently left; and, in fact, this visit is regarded as a necessary part of the process of accommodating the patient to the new situation and aids it. The first visits often have a remarkable effect in disarming the patient of fast-forming suspicions as to the purposes of friends, and help to inspire him with a salutary confidence, which aids in leading him to accept sooner the rôle of an invalid. The

friends, and this term is used to include relatives, learn by these visits to render valuable aid in the management of the case, and most readily accede to the proposition that they should refrain from visiting, if it has proved not to be good for the patient.

This practice stands the test of the continuance of the visits, even though, as is sometimes the case, the first ones are attended with some degree of excitement. The visits are almost invariably desired by the patient, who soon comes to understand, if need be, that they are allowed or denied according to his conduct, and thus a means is given for stimulating self-control. Sometimes, the desire to see friends can be aroused when it has been absent; and a curative result is gained by the exercise of a normal function of the mind in the gratification of the desire.

In other exceptional cases, as of acute mania, or others with mental confusion or stupor, the seeing of friends may seem to give negative results, and little notice may be taken of the visitors; but, in these conditions, it is well known that impressions may still go in upon the obscured perceptions, when no outward sign is given, and are remembered.

As far as moral treatment goes, in these cases of mental confusion as well as in others, efforts calculated to arouse into activity the normal elements of the mind are often of inestimable value, though no evidence of the good impressions thus made appears till long afterward. What more potent means of arousing healthy mental action than is found in the exercise of the natural affections and emotions, and the consciousness of the occasional presence of friends whom the patient has been accustomed to love and trust?

The fact that patients who have been studiously separated from friends for a long time may have had relapses from convalescence almost established, following wearily longed-for visits from relatives, is not a conclusive argument to prove that the visits were made too soon. It is a fair question whether the excess of emotion, naturally aroused by a meeting after long separation, may not produce in such cases a disaster which might be averted under the opposite plan of training the patient from the outset to receive calmly the visits, by the deprivation of which he has not been allowed to become distressed.

Another important consideration is that, when the relatives also are wearied by long separation, they are apt to remove too soon a half-convalescent patient, at first sight of the improved condition, whereas by the other plan they act more understandingly and with calmer judgment. As a matter of fact, it rarely happens under this practice that too early removal of convalescents is urged.

In regard to correspondence, the rule is also a most liberal one, as far as the asylum is concerned. The patient and friends are carefully informed at the outset that no writings of the former, sealed or unsealed, will be intercepted by the asylum authorities, who prefer to be relieved of that responsibility. The patient is told that whatever he writes will be sent to the persons who are to be regarded as the natural or legal guardians, or to other proper persons agreed upon. Most patients readily join in this compact, if made at the outset; and the attitude thus taken by the superintendent increases greatly his influence over the patient in advising or checking him in regard to writing. It often happens that what one is free to do he does not care to do, or, if he becomes dissatisfied sometimes with the action of friends in arresting letters,—as of course must be done for the protection of the patient from consequences he would afterwards regret,—there is, as a rule, a good reason to be given. At all events, it is found that dissatisfaction is reduced to a minimum; and it is made clear that there is no reason known, as far as the asylum is concerned, why all letters should not go from it. It is easy to gain through friends the valuable information concerning the state of the patient's mind afforded by his letters; and the friends, being taken into the management of the case throughout, have a better understanding of their duty to the patient when his home relations are resumed.

One more important point is that every well-behaved visitor, if it is desired, is allowed to go to the room of any patient it is proper for him to visit, with due regard to the comfort of others. The nurses are trained to expect this at any time, and it is demonstrated to all concerned that there are no dark places in the asylum to be concealed.

In thus setting forth the working of what is, theoretically and virtually, a removal of restrictions that have been regarded as peculiar to hospitals for the insane, the aim is to show that this is justifiable as the logical sequence of the carrying out of the principles recited in the beginning of this discussion. As a practical demonstration of the results of the effort being made to put this asylum on the basis of a general hospital, particularly as to its being an open and accessible institution, it is shown by this report that the twenty-six recoveries of the last year were possible under the liberal rule which permitted, from the beginning of the treatment of these cases, including various types of acute mania, melancholia, etc., regular communication with relatives and friends, guarded by a careful study of its effects and its occasional limitation.

It was the influence of the growth of the principles cited that wrought the improvement in asylum management from the days of Pinel and Tuke to the present time. It is not so many years since it was believed that there was a special curative influence in entire separation of the majority of the insane from friends for long periods, and in their strict seclusion in asylums. Not only was rest in bed enforced by mechanical restraint to prevent exhaustion in maniacal cases, but many appliances were employed to keep quiet the restless sufferers from nervous irritability. It has gradually come to pass that, at the present time, large freedom is accorded to the insane; and the former practice of seclusion from friends and interdiction of communication is greatly modified, and in some instances reduced to small proportions. The practice is not uniform in this regard, however; and there is reason to believe that the views held by many alienists are but a modification of the former ones as to the curative effect of strict seclusion in hospitals, although some have gone so far in this direction as to practically abandon it.

The truth lies somewhere between the older view and a modern one, in regard to the treatment of the insane at their homes. It is believed that the line may be drawn at the point of the removal of the patient to hospital and his separation from home and the former "moral and physical surroundings," and that beyond this point, the accepted rule of practice should be that liberal communication with friends is to be used as a therapeutic means.

Some evidence of a negative character is available in support of this proposition. It appears not only that the growing liberality of modern times in this regard is doing no harm to the insane, but that there is some special evidence to show that in the treatment of melancholia, which includes so large a class of cases, the methodical employment of seclusion and rest outside of hospitals for the insane has actually failed to be of benefit. While the older views of seclusion and rest have been undergoing modification leading to practical abandonment by some of those who have treated the insane, one of the most important contributions to the healing art in modern times is that made by Dr. Weir Mitchell in the well-known doctrine of "Rest Treatment" by means of "seclusion, rest, massage, electricity, and overfeeding," so successfully employed in the treatment of nervous exhaustion.

If, then, "seclusion" and "rest" are of such essential value in the treatment of nervous exhaustion in persons not insane, why are they not also of value in insanity, which often is simply a greater degree of the same disorder of the nervous system? The answer is, possibly, that in the former case the functions of the reasoning faculties are so nearly in a normal state as to permit "seclusion" to be regarded and accepted by the patient as a reasonable necessity, and the path upward toward health is from a point where the

mind is not controlled by delusions or given up to despair. After the mental functions are unbalanced we have to deal with a new set of conditions, and our efforts must be more largely addressed to the moral treatment of the disordered and weakened mind.

In experiments with the rest treatment here, during the past three years, it has been found necessary to modify it. Cases of mental depression are apt to have this increased by rest in bed, and, to those in which melancholia is accompanied by a state of nervous irritability and constant uneasiness or anguish, enforced rest is intolerable and positively harmful. While rest is useful in some conditions of melancholia and other cases, and benefit has been derived from massage by producing tissue waste and improving nutrition, and from the other means of treatment, "seclusion" has been almost entirely abandoned as not useful and as depriving the patient of what is beneficial. Interesting and valuable evidence on this point is generously afforded me by Dr. Mitchell, who has given me permission to quote from a recent letter some statements which he has never published. He says that in the treatment of "not a small number of cases of melancholia with bad nutritive breakdown, in which I attempted to relieve by rest, etc., I made some successes, but more failures—made, in fact, so many that I gave up at last the effort to treat in this way distinct cases of melancholy." "I may use massage or electricity in melancholy, but I do not seclude or rest these cases."

The rest treatment has been for some years extensively and most successfully employed by Dr. W. S. Playfair, in England. He says, in the London *Lancet*, December, 1881, of the cases that are likely to lead to disappointment, that one class is of those in which there is some definite mental disease, and, after a short trial in melancholia, he felt bound to relinquish the treatment.

What is true of "seclusion" in the treatment of melancholia has also been observed here to be true of other forms of insanity, and concurrent testimony is not lacking from those who treat the insane in hospitals.

While there is unquestionably a growing liberality in the matter of freedom of communication with the insane in hospitals, it is to be recognized that more will be accomplished in this direction by acting upon a correct theory and with a clear purpose. Instead of a modification of the old rule, its reversal is advocated, and the making of limitations of communication the exception to the rule.

The point now desired to be made is that there is a scientific reason for putting the insane sick person upon the same basis, both as to medical and moral treatment, as the general hospital patient; and, in regarding him simply as the subject of a disease in which normal function is acting under abnormal conditions, it is, therefore, good practice to unhesitatingly foster, encourage, and, if need be, stimulate the exercise of all normal mental functions, being guided by symptoms as they appear as to all modifications of the general principle in regard to change of residence, restriction of liberty, and seclusion, as well as medical treatment proper.

Statistics of the North Carolina Insane Asylum, Dr. Eugene Grissom, Superintendent.—The annual report of this institution for 1882 shows that the total number of admissions since the opening of the institution, in 1856, amounts to 1467. The total number discharged, for the same time, is 1189. Of these, 385 were discharged as cured, 151 were improved, 225 unimproved, and 429 died. There are now under treatment 278 cases. There was a total of 334 cases treated during the year 1882.

Statistics from many more asylums might be given, and such reports as I have before me all testify to the highest degree of continuous and faithful labor among the insane, for their welfare and cure, by the superintendents of the asylums in the different States of the Union, but want of space forbids the insertion of any more. To all these men is due from the profession a generous recognition of their services in the field of psychiatry and in the cause of humanity.

The ratio of recovery in insanity depends largely upon the character of the diseases and the ages of persons received in our asylums and hospitals; also upon the length of time the disease has existed, and upon the degree with which it has affected the system. Persons in whom mental disease has existed for several years, or who have experienced several attacks, or persons beyond sixty years of age, or, finally, those affected with organic disease of the nervous system, rarely recover, and, consequently, when any of these characters of disease largely prevail the percentage of recoveries becomes less. There is very little doubt that, in an increasing number of cases, insanity is dependent upon organic changes in the brain and spinal cord. If this be so, it will not tend either to a diminution of the number or to an amelioration in the character of the mental disorders of those who are now sent to our State institutions for treatment. There seems to be a thorough ignorance among the general population of the primary laws and conditions of mental health, and the greater part of the people neither understand nor practice such hygienic regulations as are necessary for its preservation. Educated men, professional men, clergymen, lawyers, and physicians do not seem to understand that the laws of mental health *imperatively demand* change and variety, failing which, the brain inevitably succumbs. Our women, too, need more change, rest, and recreation, especially those who live in the country districts, to change the ceaseless current of thought, care, anxiety, and household work.

Pinel's and Esquirol's Improvements.—As Pinel was one of the first to properly recognize and classify insanity, so, in speaking of treatment, we would refer to him in his humane endeavors and successful efforts to do away with the beating and cruel treatment of the insane. He has elsewhere aptly been termed, "The Father of the Modern Treatment of Insanity." His pupil, Esquirol, also, was the most successful of his immediate successors in carrying out Pinel's ideas in treating insanity and in advancing the scientific knowledge regarding it. The treatment of insanity has improved up to the present day,

and the success which has been reached in abridging maniacal attacks and warding off dangerous excitement gives us a much different class of patients, both in behavior and appearance, than could have been found fifty years ago. This change, which has taken place gradually as the natural result of improved modes of treatment, has not been fully recognized by the profession at large. Kindness and moral and hygienic treatment have achieved great triumphs over the cruel, harsh, and unsympathizing methods which characterized former times. One great rule to be observed in the management of the insane is that they are invariably to be treated with kindness and consideration. Their peculiarities should never be lost sight of, but should never be made the topic of conversation or ridicule. In the excited state of the nervous system in the insane a careless or an unkind word is often deeply felt, and all efforts toward a cure may be rendered futile by the patient perceiving in his physician the want of sympathy and kindness of heart which he, above all others, has a right to expect and demand from us. The insane are as amenable to kindness, as a rule, as sane people, and will almost invariably repay it by good behavior, while the opposite course is quite as sure to counteract all our efforts in their behalf. As in all other diseases, hygienic influences must be insisted on, and pure air, pleasant surroundings, and good food are of great importance. The mind, to be normal, must be associated with a healthy physical state, and we must, in the treatment of the insane, attend primarily to these things, and not, by any means, regard them as beneath our notice.

Home Treatment, or Treatment away from Home.—Many persons question the propriety of confining a patient in an asylum, private or otherwise, maintaining that if they can afford to keep the patient at home and provide medical attendance, and an attendant for him, he is much better taken care of. This, with the exception of a limited class of cases in the incipient stages of insanity, is a very mistaken idea, and one very injurious to the patient himself. One of the most marked characteristics of the insane man, is his intense egotism, if it may be so called; or more properly speaking, it consists, in the language of Dr. Blandford, in an "extreme concentration of the whole thought and ideas on self and on all that concerns self." At home he is more or less the master of the house, and regards himself, when restrained, as a deeply injured man, and chafes much more, and is more truly a prisoner in his own home than when allowed the com-

parative liberty of a well-regulated private or public hospital for the insane.

When in such a hospital he loses or merges his identity more or less with his companions, which is an excellent thing for him, as he ceases to be the centre of observation and remark, and is treated and noticed precisely in the same way as are the thirty or forty other patients who are his companions. A very striking instance of this kind occurred in a patient of good education, who, upon becoming insane, imagined himself the Supreme Being, and insisted upon exercising all the fancied prerogatives of such a being.

He became very troublesome and dangerous to those about him, and was entirely absorbed in the contemplation of his own greatness, which idea was fostered by the attention he received, and the private room in the asylum of which he was an inmate. He was accordingly removed from his room to a ward in the asylum containing twenty or thirty other patients, and was given to understand that the amount of his liberty and the privileges which he enjoyed would depend entirely upon his behavior. He at once perceived and at first angrily remonstrated against the want of attention paid to his whims and caprices, but soon understood that he was not regarded by the attendants as in any way superior to the other patients, and in their treatment of him was manifested no attention at all to his delusion. Finding his endeavors to exercise his authority fruitless, he gave up his imperious and unrestrained demeanor, and soon submitted quietly to the order and discipline of the institution, and was afterwards one of the best-behaved patients in the ward, rarely recurring to his delusion.

Moral Treatment.—Regarding the moral treatment of the insane, the physician's attributes have been well defined by Drs. Bucknill and Tuke as follows: "The physician who aims at success in the moral treatment of the insane, must be ready 'to be all things to all men, if by any means he might save some.' He must, nevertheless, have a good backbone to his character, a strong will of his own, and with all his inflections be able to adhere with singleness of purpose and tenacious veracity to the opinions he has on sound and sufficient reasons formed of his patient, and the treatment needed to be pursued towards him. With self-reliance for a foundation to his character, it requires widely different manifestations to repress excitement, to stimulate inertia, to direct the erring, to support the weak, to supplant every variety of erroneous impression, to resist

every kind of perverted feeling, and to check every form of pernicious conduct."

Clinical Instruction in Hospitals.—In connection with the subject of the treatment of mental disorders, I think there is a much needed reform, which, if carried out, would make mental disorders far better understood by the medical profession generally than they are to-day. The trustees and managers of our lunatic hospitals are too often opposed to reforms, and wish no changes or improvements; but I think the change I propose is due both to the general medical profession and to the public who support them, so that the general practitioner may be so educated that he may recognize the first symptoms of insanity, and be able to cure it in its incipient stages, without perhaps having recourse to a State hospital for the insane at all. I refer to a proper provision, which ought to be made in every public hospital for the insane, for both clinical and pathological instruction, by lectures by the physician in chief and others, to diffuse a thorough knowledge of the disease and its treatment throughout the medical profession. With such knowledge as could easily be acquired in this way, physicians could probably cure many patients in the early stages of the disease, so that it would be unnecessary to send them to a hospital at all. Insanity is much more important than many diseases which receive very careful study in our medical schools, and I think it of equal importance at least that this class of cases should receive a due amount of study. It is a great mistake to erect such large and expensive buildings, costing three or four thousand dollars for each patient; making efficient administration very difficult; abuses more likely to occur; aggregating great masses of mentally diseased persons, so that both the per cent. of cures is less and the rate of mortality greater than in smaller hospitals; making good ventilation next to impossible, and also rendering efficient drainage and sewerage very difficult; and making daily remedial exercise in the open air for all the inmates, when possible—a most important therapeutic measure—very difficult indeed. We should have smaller hospitals and more of them, and the insane would then have more employment, more liberty,—and, in my opinion, a better chance of cure than when confined in an overcrowded hospital.

Food, Amusement, Work, etc.—In treating the insane, the great necessity is for better food, more amusements, which draw off the mind from the delusions which occupy it, and combat depression of mind

by bringing before it new scenes and objects, and lastly, more freedom and liberty and less mechanical restraint. We have improved the condition of the insane materially during the past few years, and have rendered a residence in an asylum less irksome and more beneficial for those who are obliged to resort to such institutions. We have abolished mechanical restraint, except in rare instances where it is necessary for the patients' safety or of those about them; have abolished all forms of punishments, and have improved the quality of food and clothing. The insane should be encouraged to go outside of the walls of the institution of which they are inmates, as far as is practicable, for work or pleasure, when their behavior justifies this measure. In this way they are put on their honor and good behavior, and where one may occasionally escape, doing but little injury, thousands will be essentially benefited, and, in some cases, cured for life. The physician should ascertain what bodily and intellectual exercises have been pursued by his patient in early life, and should endeavor, by proper appliances, to bring these external causes to bear appropriately upon each particular case. Attempts may also be made to restore the healthy function of mind by recommending such literary studies and accomplishments as have been known to previously interest and amuse the patient. The treatment must be of a varied character to meet the requirements of each case at different periods. We must remove the disease, build up the health, draw off the mind from morbid fancies, and lead our patients to brighter and more healthy views of life and its surroundings. We must combat diseased actions, produce sleep, and strengthen the whole system. We must lead our patient to a careful, regular, and more healthy course of life.

In insanity we have an abnormal state of nervous tension and pent-up nerve-force, which must expend itself in some direction, and must generate an equivalent manifestation of force, either in *feeling*, *thought*, or *bodily action*. If, then, we cause the nervous excitement or pent-up nerve-force to be expended in bodily or muscular action by means of employment, we shall decrease correspondingly the morbid thoughts and feelings which are caused by the intensity of the cerebral excitement. If we allow our patients to remain idle, the whole pent-up nerve-force is expended and concentrated upon *thought* and *feeling*, which become morbidly intensified and perverted, and at last produce incurable and organic changes in the brain, which might have been arrested by drawing off the nerve-force in the channels of

labor and employment, and giving a new direction to the thoughts and feelings. Out-of-door work is very valuable for patients in promoting assimilation and digestion, and strengthening the muscular system, and should be employed whenever practicable. Light work gives the patient something to think about, and occupies his mind in a healthful manner, while being shut up constantly indoors tends to enfeeble the body, and the mind is occupied too often in revolving the delusions which it should be the aim of the physician to banish as far as possible. As it is impossible for the majority of patients to be employed in this manner, it is desirable to find some light employment indoors. While it is comparatively easy to find employment for women, such as sewing, knitting, washing, and making dresses, the men are not so favorably situated, as the expense of fitting up workshops is so great that in most instances it is not considered a sufficiently valuable adjunct to justify the necessary outlay. They may be taught, however, to do light work, such as cane-seating chairs, etc., and in such ways occupy their minds and afford them some muscular exercise, however slight. The foreign asylums have systematized manual labor to a much greater extent than in this country; and some of them, as the Asylum of Quatre Mares, near Rouen, do a great deal of work in all the trades. There was, a short time ago, an interesting exhibition for the public in the lunatic asylum at Brünnfeld, near Vienna. The objects exhibited were divided into three classes, the first comprising 215 articles made entirely by the patients; the second, articles destroyed by them in their maniacal excitement; and the third, models, etc., showing how they are lodged and clothed. Among the articles in the first class are delicately-carved meerschaum pipes, lace, picture-frames, and a remarkable collection of paintings by Kratky, who, before he became insane, was a celebrated artist at Vienna. These paintings show no sign of his insanity, and one of them was a wonderfully life-like representation of the insane hearing mass in the chapel attached to the asylum. Next to these specimens of the constructive skill of the inmates are placed huge iron bars bent double, spoons and iron plates broken to pieces, and doors split in half. The favorite occupation was writing and drawing, in which some of them had become very proficient. Recreation is also more indulged in abroad than in our asylums. At the Fisherton Asylum, near Salisbury, England, which is a private institution, accommodating about six hundred patients, a separate brick building was erected for

the purposes of recreation. It is one hundred feet in length by thirty in width. At one end of the interior of this building is a stage, fitted up with all the accessories for private theatricals. At the Prestwick Asylum, near Manchester, is a very large and handsomely-painted room, which is devoted to music and theatricals. At the lunatic asylum at Ghent, the Hospice de Guislain, are four hundred and seventy male patients, who are variously employed in shoemaking, bookbinding, combing flax, making twine, weaving cloth, and in carpenter-work and work out of doors. There are also rooms for music and smoking. At the asylum at Clarendon, near Paris, are six hundred patients of the paying class, for whose amusement are provided a library and billiard room. The best of our own asylums afford, however, as good facilities for amusements as the foreign ones, if not on so extended a scale, while the condition of the patients and their care and treatment are, as a general rule, superior to those of the foreign asylums. There is a very interesting colony of about thirteen hundred lunatics at Gheel, in Belgium, which, in 1851, was placed under governmental control. The following interesting description of it is from the Brussels correspondent of the *Pall Mall Gazette :*

Yesterday an excursion to the lunatics' colony at Gheel was undertaken by about forty members of the International Medical Congress. Gheel is situated in the province of Antwerp, and in that portion of Belgium known as the Campine, a flat country, with fine bracing air. We started early in the morning for Herenthals, which by railway is at a distance of two hours and forty minutes from Brussels. From Herenthals a drive of one hour and forty minutes by car took us to Gheel. Near a country inn, at about a league distance from Gheel, we were already met by one of the lunatics. Dr. Bulckens, the director of the Gheel colony, under whose guidance the excursion was made, presented him to us. He answered very intelligently all the questions put to him. He had been a schoolmaster, and was now giving private lessons in French, Latin, and other subjects in the farmers' houses of the neighborhood. He begged not to be detained long, as his pupils were waiting for him. The poor schoolmaster's madness was of a religious kind. He told us that he was quite happy, and did not wish ever to leave. On arriving at Gheel we were received at the asylum—a fine red-brick building, surrounded with nice plantations—by Dr. Peters, the assistant of the director. In the committee-room Mlle. Bulckens, the director's daughter, invited us to take the usual Belgian morning refreshment —Madeira and cakes; and then Dr. Bulckens gave explanations concerning the colony. It is of very ancient origin: a legend places it as far back as the seventh century, attributing it to Sainte Dymphne (Dymphna or Digna), the daughter of an Irish king, who came to live at Gheel, where she also underwent martyrdom, and became then the protectress of the insane. However, it is proved that as early as the twelfth century foreign lunatics were sent to Gheel, for the sake of the special treatment given there. This treatment differs from that in use everywhere else. The lunatics are not kept in an asylum, but board and lodge with the inhabitants. In 1851 the institution was reorganized and placed

under the government. Since then a great increase has taken place in the number of patients sent there. The commune of Gheel, with its outlying hamlets, is very extensive. It covers 11,000 hectares, and the number of inhabitants is also about 11,000. The lunatics number now about 1300 of both sexes. The commune is divided into four sections. At the head of each is placed a medical man and an overseer. The patients are from all nations and all ranks of society, and they receive accommodation according to their means. The wealthy are placed with the wealthier class of inhabitants, and the poor with the poorer. The pauper lunatics, for whose support their respective communes have to pay, belong to the last category. The more dangerous class of lunatics are placed in the outlying isolated hamlets. They are divided into sections according to the nature of their disease, and the Walloon patients are kept in two separate hamlets (Gheel is a purely Flemish place, but most people understand French), so as to be companions to one another. The 11,000 inhabitants are, so to speak, all engaged in the surveillance of the patients, which makes about nine overseers for every patient. The surveillance, not being perceived by the patients, of course does not irritate them. The commune earns directly more than 500,000 francs annually through the keeping of the lunatics, and indirectly also a great deal through the cheap work of all kinds which the patients perform for the inhabitants. It is the personal interest of the inhabitants to do their duty well by the patients, as these are intrusted only to people whose moral fitness and means of existence are approved. In fact, a family at Gheel is not considered respectable if lunatics are not intrusted to it, and the withdrawal of them from its care constitutes a heavy punishment. The children of the inhabitants, living from their earliest childhood with lunatics, become attached to them, do not find anything ridiculous in them, learn how they are to be treated, exercise through their company a very soothing influence on them, and are, of course, not in the least afraid of them. When young people get married they ask from the authorities as a favor and a sort of dowry the care of a patient. On their arrival at Gheel, the lunatics are kept at the central asylum for observation as long as the director deems necessary. In case of acute disease they are brought back there. It also serves as the house of correction, the privation of liberty being felt as a severe punishment by the patients. In cases of great debility they are also brought there. Many lunatics, when feeling the approach of a paroxysm, demand themselves to be sent to the asylum. When a cure has been effected, the caretaker receives as a reward another patient, and if many cures occur at his house he is rewarded with the care of a wealthy patient. The number of cures averages from sixty-five to seventy-five out of the hundred. Patients with radically immoral or highly dangerous tendencies cannot be kept at Gheel, the central asylum being only a depot. The number of lunatics under temporary coercion is generally twelve out of the 1300.

We visited now the infirmary, the cells, and the halls, where the lately arrived are kept under observation. The very dirty patients, who cannot be placed with the inhabitants, have their own rooms, with suitable arrangements. We found everywhere exquisite cleanliness, and good air and light; the patients seemed to relish their dinner well; they enjoy, even in the asylum, a great deal of liberty, and if a lunatic asylum could be called a cheerful place, the one at Gheel is, perhaps, the only one to which that term could be applied. Good paved roads traverse the commune, and many houses are really fine villas, with large gardens in the rear. The first house which we visited was the house of poor people. We found the family, composed of man, wife, and three young children, and their two lunatic boarders, seated round the table at dinner. The children seemed to be quite unaware that they were sitting at the side of lunatics, nor would a stranger entering unprepared ever have thought of the presence of such persons. After some more visits of the kind, we went to the principal tavern, to which a fine large hall

is attached, where there are fêtes, concerts, and dancing every Sunday. Some of the houses of the wealthier classes were now visited. They offer all the comforts that can be desired for ladies and gentlemen. The apartments are large, well furnished, and the patient may install in them libraries and whatever is allowed by the director. We found there persons of very high social rank, and others of great accomplishments. In the streets we met at every moment lunatics lounging before the doors of the houses, smoking pipes or cigars, playing with the children, or otherwise amusing themselves. Among the wealthier class of patients at Gheel it is nothing uncommon to find persons who spend there from £300 to £600 a year. Some keep cars and horses for their use. The authorities watch carefully that the patients are not imposed upon, and that they receive its value for the money which they spend. Cases of misconduct of any kind toward a patient are, however, exceedingly rare, and the punishment of being declared unworthy to keep patients is considered a fearful disgrace. We visited the Church of St. Dymphne, the Irish princess and protectress of the lunatics. In the seventh century there existed on the spot a chapel dedicated to St. Martin, surrounded by a dozen houses forming then the village of Gheel. The style of building of the present very spacious church points to the twelfth century, the time of transition from the Roman to the Gothic style. Some parts, however, were added later. The central chapel of the diambulatorium contains a remarkable work of art, the history of St. Dymphne, carved in wood. It is divided into eight parts. The figures, painted and gilt, are of good proportions, and the faces wonderfully expressive. The parts represent: 1. The birth of St. Dymphne, who is handed over by her mother to St. Gerebert. 2. The death of the Queen, the mother of St. Dymphne. 3. The devil suggesting bad thoughts to her father, the Irish king. 4. St. Dymphne embarking with St. Gerebert for Belgium. 5. The king seeking his daughter. 6. The wicked king who has had St. Gerebert beheaded, beheading himself his daughter, as nobody else would serve as executioner. 7. Priests carrying in procession the relics of St. Dymphne. 8. A demon leaving the head of a lunatic woman, cured by prayer, and a lunatic in chains waiting his turn for deliverance. I ought to add that during our visit we met from the excellent director, Dr. Bulckens, the parish priest, and everybody we came in contact with, the most exquisite courtesy and willingness to give us information.

Mechanical Restraint and Seclusion.—Respecting the question of non-restraint in the treatment of insanity, I think it is possible to bring the treatment of the insane to that state of development when all mechanical restraint may be dispensed with advantageously. I feel sure that the complete non-restraint system will be adopted in future, but the necessary conditions for this are that our asylums must not be overcrowded, as they are to-day, and that the patients must be under constant medical supervision. Perfect non-restraint has been adopted, I think, at Hamburg, Gottingen, Berlin (Charité), Halle, Marburg, Heidelberg, Eberswalde, Keppenheim, Werneck, Munich, and Alt Scherbitz, besides all the asylums of Switzerland; also in Scotland, in some instances, and recently in England, although in the latter I am not sure that the unqualified adoption of non-restraint has met with success. I think, wherever the system of non-restraint has been properly carried out, *there have, with few exceptions, no doubts been entertained of its advantages* in the treatment of mental disorders.

Respecting the home treatment of private patients in private dwellings, Dr. Henry Maudsley says, referring to the condition of the numerous chancery patients in England who are living in private houses: "I have the best authority for saying that their condition is eminently satisfactory, and such as it is impossible it could be in the best asylum." Dr. Bucknill, in his recent essay, "On the Care of the Insane, etc.," speaks as follows respecting the private care of the insane, and, as I think, very wisely: "It is not merely the happy change which takes place in confirmed lunatics when they are judiciously removed from the dreary detention of the asylum into domestic life, it is the efficiency of the domestic treatment of lunacy during the *whole course** of the disease which constitutes its greatest value, and of this the author's fullest and latest experience has convinced him, that the curative influences of asylums have been vastly overrated, and that those of isolated treatment in domestic care have been greatly undervalued."

Respecting the treatment of the insane without mechanical restraint,† Dr. Henry Maudsley says:

It should be borne clearly in mind that the abolition of mechanical restraint is not itself a principle, but a detail of practice founded on the principle which inspires what is called the non-restraint system. A very bad system of moral management might prevail where no actual corporeal restraint was used; and, on the other hand, it is possible, though not probable, that means of restraint might be used occasionally and yet the management of patients be in other respects good. To scold, bully, or punish an insane patient would be almost as injurious to him, and certainly as contrary to the true principle of the non-restraint system, as to apply mechanical restraint. Experience proves most decidedly how beneficial is the influence of a good attendant, how pernicious is the influence of a bad attendant on a patient suffering from mental disorder; the patient will degenerate under the influence and harsh usage of an ill-tempered person as plainly as he will improve under the sympathy and gentle behavior of a kind and considerate person. He

* Italics are mine.

† Some American alienists consider that the English run great risks by their total non-restraint, and that, owing to insanity being of a more severe type in America, that total non-restraint is alike unwise and oftentimes prejudicial to the best interests of the patient. —E. C. M.

During a recent visit to Philadelphia, we talked with Dr. Henry B. Nunemaker of the Philadelphia Hospital for the Insane upon this point, and he seemed to be decidedly of the opinion that insanity is gradually assuming a milder type in our own country, which had made itself very manifest during the past five years. This is a very important fact, as, if correct, it will lead rapidly to the abolition of restraint. It has been claimed that the type of insanity in England is much milder than with us, while in France, it approximates more nearly the American type of insanity. Climate and national temperaments are assigned as predisposing causes of the prevailing type in any country.

has more than once known instances of patients who have, without exaggeration, been cured by judicious change of attendant. The greatest of difficulties, indeed, in the treatment of the insane, is to obtain suitable persons to fill this trying and most responsible position. Qualities of head and heart are demanded such as would secure for their possessor higher remuneration and less onerous duties in a more eligible vocation. The accidents and injuries in asylums, which have lately excited so much attention, have indicated the weak point in asylum management—the want of a properly trained and high class of attendants, and of an adequate supervision of these immediate guardians of the insane by officers of a higher standing. It is to be feared that patients are, in some instances, left too much at the mercy of attendants. Now, to place an insane person at the mercy of a coarse, violent, and ignorant attendant is to adopt the surest way of rendering him furious, unmanageable, and finally incurable. With his delusions of suspicion or fear he mingles inseparably the realities of the treatment to which he is subjected, and if this be at all harsh and unsympathetic he naturally becomes furious, and resists it with all the energy of his frenzy. His delusions are thus strengthened and fixed; whereas, by gentle usage and sympathetic attention, his confidence is gained and they are gradually undermined. Angry usage—nay, even an angry word—sometimes does incalculable mischief. It is easy to perceive that if a patient imagines himself to be in hell or about to be murdered, and those around him to be devils or murderers, as happens now and then, he is not likely to be disabused of his morbid idea by devil-like treatment. The principle of the non-restraint system, in the true acceptation of the term, is, whilst avoiding a meddlesome interference, to make all the surroundings of the poor lunatic as tranquil, as orderly, as gentle as may be consistent with his proper care, to counteract the commotion in him by an absence of commotion in what is around him. The lunatic cannot, any more than the sane person, resist the steady influence of his surroundings; he assimilates them unconsciously, and they modify his character for good or for evil.

How little a system of mechanical restraint fulfils the conditions of the just principle of treatment is so plain that a wayfaring man, though a fool, can hardly fail to see it. An excited, active patient, urged by an uncontrollable instinct of movement, desiring and needing, above all things, freedom of limbs, is secured, hand and foot, by mechanical appliances; with what result? That he is provoked into furious mania, expends his energy in shouting and raving, and becomes dirty in his habits. Dirtiness in some shape is, in fact, unavoidable under such circumstances. But it may be argued, as it is sometimes argued, that it would be better for the patient to be so restrained mechanically than to be restrained by the efforts of attendants who, in the excitement of struggling, are apt to overpass the limits of a temperate exercise of force, and to proceed to passionate acts of violence. No doubt, if it were necessary to have such struggles where restraint was not used, and not necessary to have them in order to apply restraint, there would be something to be said in favor of its use. But it is very seldom necessary to have a physical contest with a patient; indeed, if contests of the kind were of frequent occurrence, it would be strong evidence of a bad moral tone in the management, and of a neglect of proper medical treatment. If the whole treatment of acute insanity consisted, as some persons seem to imagine, in mastering the patient by physical force and in endeavoring to stifle excitement by means of opium and other sedatives, there can be little doubt that violent struggles and restraint, in some form or other, would be found necessary. But if an indiscriminate use of sedatives be avoided and a rational medical treatment be directed to the bodily disorder which will commonly be found to accompany mental derangement, and if, furthermore, the moral management be sympathetic and prudent, it will be seldom necessary to resort to physical violence.

Let it not be supposed, moreover, that the imposition of mechanical restraint does away

with scenes of violence. Far from it; it encourages them. Much violence must usually be used in order to apply the means of restraint, a desperate contest occurring before the patient is overpowered and left helpless, exhausted, and furious, with a bitter sense of degradation. Such struggles breed similar struggles, and the restraint used necessitates a frequent recurrence to it. There can be no greater fallacy than that of supposing what is called a moderate use of mechanical restraint to be consistent with a general plan of treatment in other respects humane and beneficial. It must be dispensed with altogether, or deterioration will ensue in the patient, and all kinds of neglect and tyranny will be engendered by degrees, until restraints become the usual substitutes for forbearance and watchful attention. As one great argument against slavery was that it demoralized the slaveholder, so a very bad effect of the employment of restraint in dealing with the insane is that it demoralizes attendants. And on this ground, if there were no other grounds, it is necessary that the abolition of restraint should be absolute to be efficient; the principle of the non-restraint system will admit of no compromise.

It must be allowed that when called to treat an acute case of insanity in a private house, it is not always so easy to do without restraint as it is in an asylum, where there are suitable appliances for meeting the difficulties which the excitement and violence of a patient may present. But if a medical man finds it absolutely necessary to employ mechanical restraint, he should, if he has the welfare of his patient at heart, send him elsewhere, for, either it is not a fit case for private treatment or he is without the requisite assistance and qualifications for treating it properly. The attendants on whom he depends are probably ignorant and incompetent.

It should be clearly understood by those who feel any doubt of the value of the non-restraint system that, although it is not fully adopted in foreign asylums, it has been warmly advocated by the most eminent foreign alienists who have witnessed it in operation in English asylums. Morel, of Rouen, after living some time in an English asylum, in order to make himself practically acquainted with its working, became, and has since been, one of its warmest supporters. The late Professor Greisinger, who, once an opponent of non-restraint, made a journey to this country especially to examine into its merits and alleged demerits, became an earnest defender of it, and applied it with great success in the asylum connected with the Charité at Berlin. Ludwig Meyer introduced it with the most beneficial results into the asylum at Hamburg, over which he formerly presided. Others have followed and are following in the wake of these distinguished men. With such testimony coming from abroad, it is somewhat sad to find that doubts should arise in the country in which the non-restraint system had its birth and has attained its fullest development. Our author cannot think that, in face of the irrefutable evidence of experience, they will have a long vitality, and he certainly does not hesitate to express a strong personal conviction that the use of mechanical restraint in any asylum, public or private, is an indication of a badly-managed institution, and that its use, in the treatment of private cases, is unnecessary and prejudicial. Where it is entirely dispensed with there will be less excitement, fewer scenes of violence, less need of secluding patients, and earlier and more numerous recoveries than where it is in use. For it is not only an evil itself, but it is the fruitful parent of a multitude of ills, not the least of which is the certain deterioration of all who have any part in its employment, whether suffering or doing.

The late Dr. Isaac Ray, of Philadelphia, in writing on the management of hospitals, speaks thus of mechanical restraint and seclusion, and the general welfare of the insane:

The reformer's creed frequently contains but a single article of belief, namely, this: because a thing is bad, therefore the directly opposite thing is necessarily good. The effect of this fallacy has been strikingly manifested, for instance, in the controversy, not yet settled, respecting mechanical restraint as applied to the insane. Everybody admits that it has been grossly abused, but an immense difference prevails as to the practical inference that should be drawn from the fact. While it leads one party to use it for proper purposes and in a judicious manner, so as to secure its benefits and avoid its evils, it leads another to disuse it altogether as an unmitigated wrong. Of course, abundant reasons are offered for the correctness of each of these conclusions, and they are not without their force; but—in accordance with a common phasis of belief—they have probably less to do with actual opinions than a state of feeling antecedent to all reasons. This accounts for the difficulty of arriving at the truth in all questions of practical reform; but the number of those who learn from it a lesson of caution against hasty conclusions will always be small. In the present case there is a touch of the romantic in the idea of managing the insane entirely without mechanical restraint, and solely by moral suasion or the gentle laying on of hands; and when first announced it is not strange that it was taken at once into public favor. It had all the *éclat* of a great discovery, worthy of being compared with that of anæsthetics or the vaccine virus; and in England, where it originated, it needed more than an average share of moral courage to regard it with the slightest distrust.

One thing leads to another; and the idea of complete non-restraint was followed, in the fulness of time, by that of banishing all those distinctive architectural arrangements supposed to be indispensable to the proper care and custody of the insane. Open fires on the hearth, windows without guards, and doors without locks, have been adopted in one or two hospitals lately erected in England. It is not surprising that men of a sanguine, philanthropic temper, should hail such innovations with their warmest approval, and that under the pressure of public sentiment they should be sustained, temporarily at least, at all hazards. The careful observer, who studies insanity like any other object of scientific investigation, will hardly be satisfied with the reasons offered for such a radical reform; and though willing to accept results as the proper tests of their soundness, he will require that the experiment shall be tried on a large scale, by various parties, and its indirect and contingent, as well as immediate results, be fairly taken into the account. No experiment in the management of the insane can be considered successful, merely because no indications of failure are visible for a limited period, or under peculiar circumstances. For the very object may be, not to prevent an evil which otherwise would be sure to happen, but to meet a contingency that may never occur. The mere fact that it does not occur has no necessary connection with the means of prevention. No one at all conversant with hospitals for the insane can have failed to see that, in some degree, their results are apparently a matter of chance. To attribute them entirely and exclusively to management would be no mark of wisdom. The man who congratulates himself on the success of his measures for preventing suicide, on account of entire exemption for several years, will find his self-complacency somewhat ruffled when, without any change of practice, several cases occur in rapid succession. So, too, he may find that the large proportion of recoveries, and the small proportion of deaths and casualties, which for a time seemed to be indisputable proofs of his skill, are attributable to causes over which he had little or no control. Now, to ascertain how far this element of chance prevails, must always be a work of time; and we may fairly challenge the soundness of any conclusions where sufficient account has not been made of its influence.

Another error very incident to measures of reform in our specialty is to mistake individual traits for general conditions, and thus conclude, prematurely, that what is appli-

cable to one case is no less applicable to all. Diversities of disease, of previous management, of natural character, may all be ignored, and some procrustean plan regarded as embodying all the wisdom worth retaining. A patient long subjected to mechanical restraint improves under its disuse; therefore no patient requires it, and complete non-restraint must be the unexceptionable rule. Another is annoyed by the sight of locks and guards, which, in fact, are unnecessary for him; therefore they are annoying to all and unnecessary for any. Another desires to go out unattended, and undoubtedly is all the better for the privilege; therefore unrestricted freedom in this particular should be the general rule. Deductions like these may seem somewhat puerile, but they are scarcely exaggerations of what have actually been made. Now, with all admiration for the spirit underlying these projected reforms, I am still obliged to doubt whether they do not exhibit some confusion of thought, both as to the ends which are proposed and the conditions of a successful experiment. These two questions it may be well to consider for a moment, beginning with the latter.

Morbid movements of the nervous system often require considerable time for their completion, and are marked by a certain periodicity not apparent in other affections. What we happen to see may be but a single phasis of the movement, to be followed by others equally prominent before the morbid cycle is completed. What it may reveal precisely, we cannot predict before it is completed. Now, a kind of management that may be very proper in regard to one of these phases may not be so in regard to another, because the wishes and feelings of the patient, the force of his impulses and the gravity of his disease, may present the utmost possible difference. An inflexible rule of management, by ignoring these diversities, must necessarily occasion much mischief, directly or indirectly; and not more does the individual differ from himself at different periods, than does the general condition of the house. The expediency of non-restraint, for instance, might be very differently manifested, even in the same establishment, at different periods, inasmuch as several months of complete disuse of restraint might, very properly, be followed by as long a period of its abundant use. We should not suppose we had cured a case of epilepsy or hysteria merely because the period since the last fit has been much longer than any previous interval; or that a maniacal patient had recovered, because the high excitement had passed away and he replied to a few questions correctly; why, then, should we be required to accept any principle of management which has been tried, however successfully, on a limited scale and for a limited period? It is no satisfactory reply to the patent objections that lie against this or that arrangement, to say that no harm has arisen from it, so far. Great care, aided by great good luck, may unquestionably save us sometimes from the legitimate effects of a faulty arrangement. But in any provision relative to the management of the insane, it should be implicitly required that its operation should depend as little as possible on the chances of fortune or the shortcomings of men. Its merit should consist, in a great measure, in its independence of these contingencies. Success, in spite of manifest danger, would be a very feeble argument in favor of repeating the experiment. To say of it that we have got along under it without any untoward event, is to render but a vulgar estimate of success, though one most intelligible, perhaps, to the multitude. Let us bear in mind, too, that a broader field of trial, a wider scope of comparison, a more impartial judgment of results, is necessary, than any single individual can fairly claim.

Much error has been committed on this subject, in consequence of misunderstanding the proper ends of any reformatory measure in the management of the insane. The philosophical test of social and political reform—the greatest happiness of the greatest number—must not be exclusively adopted here. A provision is not to be hastily discarded merely because it has been attended by abuses, or because its evils, on the whole, seem to over-

balance its benefits. The careful inquirer will first ascertain whether, by some administrative change, the former may not be prevented, and the latter retained. To give up a provision which is known to serve an excellent purpose, because in the hands of the careless and heartless it has been made an instrument of wrong, may be wise under some circumstances, but can hardly be considered a triumph of professional skill. True science, true skill, consist in meeting the exigencies of each particular case; and though these must sometimes be subordinate to the general good, this necessity must be regarded as a defect rather than a merit. The question we have to deal with is, how we can best reach the needs of each one of those individuals who make up the collective body under our charge; and so long as we keep this end before us, we may be sure we are on the right course. When, however, we strive after something above and beyond this, seeking, for instance, to establish some general rule or practice calculated to strike the fancy and to win the applause of the inconsiderate, there is great danger that the other and more important end will come to hold an inferior place in our regard. There may be no incompatibility between these ends, for many, I doubt not, are steadily keeping them both in view; but there is a natural tendency to seek that which is most easily appreciated by all who look only on the outside, and which, by such, would be regarded as indicative of originality and vigor. We see it in the idea, too often put forth, of claiming merit for encountering great risks with but little actual damage. So many epileptics have frequented a room having an open fire, so many uneasy, discontented patients have been allowed to go and come as they please, so many pugnacious ones have mingled freely with the rest, so many homicidal ones have been intrusted with edge-tools; and yet nobody has fallen into the fire, nobody has eloped, nobody has been struck, nobody has been killed or wounded. As if such a result might not possibly have been a remarkable instance of good fortune rather than the sign and seal of a blessed reform; and as if the welfare of the individual patient were a matter of little concern compared with the working of a general rule. I would not be understood as saying, that in the management of the insane we are to incur no risks whatever; in other words that we are to withhold from them every privilege and the slightest measure of freedom, because they might possibly abuse them. The whole theory of modern management implies risk, to be avoided, however, as much as possible, by the exercise of discernment and tact. Sometimes, indeed, a desirable end can be obtained only through more or less risk, and on the general question there can be but one opinion. But such risks must be carefully distinguished from those which involve the welfare of others, or tend only to glorify individuals. If an attempt to benefit a particular patient by some exercise of risk, applicable solely to him, fail, he alone is affected; and if the circumstances fairly justified the attempt, he cannot complain. But if, while it is applied to one person, its consequences fall upon another, then the latter has good reason to be aggrieved. When a sanguine believer in non-restraint systematically exposes his patients to the assaults of those who are inclined to such mischief, in the vain expectation that any practical amount of vigilance can obviate actual harm, he will hardly be able to justify the occurrence of unpleasant casualties by pleading the common good. The sufferers would reply, and very properly too, that they were placed under his care for their own particular good, and not for the purpose of enabling him to work out some favorite theory. And they might also say that they were so placed, mainly for the purpose of being saved from themselves and others.

I believe that the reasons urged in favor of some of these reformatory measures are founded in incorrect notions of insanity, and especially of the thoughts and feelings of the insane. It is contended that the safeguards which have been placed around the patient should be removed, because they are supposed to annoy him by constantly remind-

ing him of his infirmity, and proclaiming from every door and window that he cannot be trusted. Unquestionably, in a small proportion of cases, restraint of any kind is disagreeable, and, perhaps, unnecessary; but it is equally certain that to many patients it is not even a source of discomfort. The latter class have an habitual sense of insecurity, fear to be left to themselves, and welcome the means of restraint. Many of those, even, whose form of disease is marked by high excitement, feel at times a consciousness that they are unfit to be at large, and recognize the necessity of those abridgments of their freedom which a hospital involves. Much of the repugnance which the insane are supposed to feel to the restrictive arrangements of a hospital may be fairly attributed rather to that captious, fault-finding spirit so common in the disease, than to any keen sensibilities in the matter.

When restraint of any kind is required, let it be applied, we are told, by the look and the touch of an attendant, not by barbarous implements of wood and iron. Mistakes have been made, no doubt, as to the amount of interference compatible with the best interests of the insane, but we ought not to err very widely as to the amount of care and vigilance that may be reasonably expected of attendants. Natural disposition and temperament, tact and culture, may affect the result somewhat, but we well know that beyond a certain point these qualities, in their best estate, are perfectly impotent. For a short period and an imminent emergency, we may be warranted in relying upon them implicitly. But lengthen the period, or render the contingency more remote and uncertain, and to that extent personal vigilance becomes unreliable. An attendant placed in charge of a patient incessantly bent on self-destruction may be safely relied on for several hours; but let it be his sole business to prevent a patient from striking when the impulse comes, which may be but once in two or three months, and who that knows anything of the subject supposes that the blow will not be struck at last? The continuity of attention required for this purpose may not be impossible, but in practice it would be idle to expect it. In fact there is really no relation between the ends and the means. The question is not which of the two kinds of restraint, personal or mechanical, is preferable in this case, but whether the latter is not the only one capable in the nature of things, of effecting the purpose. Considering the matter in reference to its immediate effects on the patient, and unconnected with theories or biases, it seems difficult to conceive how there could be two opinions about it. And in the class of cases where either would be admissible, I have been led by twenty years' experience to believe that a simple contrivance of leather or cloth placed on the limbs, performing its service quietly and steadily, is infinitely preferable to an array of attendants holding the hands and feet, and at every relaxation of their efforts provoking renewed struggles from the patient.

It has been of late years somewhat fashionable to ignore some prominent traits of insanity, or at least to suppose that they may be kept in abeyance by devices of management. The insane should be treated more like the sane, trusted with responsible duties, and thrown much upon their own power of self-control. No one would dissent from the general principle implied in this statement, because it is characteristic of all humane and intelligent management; but unquestionably some have been disposed to carry it to an almost unlimited extent. Among them was one whose name was intimately associated with the history of our specialty in this country. His practice was to treat his patients as if governed by the principles, motives, and impulses of sane men, until the contrary appeared. Very brilliant results sometimes followed this management, and some not so well calculated to recommend it for general adoption. He was fond of taking visitors to a window and showing them three or four patients mowing together in an adjacent field, all of whom had committed homicide. There was something very extraordinary, no doubt, in such an exhibition. To those who are governed by appearances merely,

it indicated the triumph of the strong will and the commanding presence, over the lower instincts of a diseased mind, and excited the usual admiration produced by the marvellous.

No good can come by shutting our eyes to an old truth, merely because it is old, and believing that the world has always been mistaken in the idea that a disposition to mischief is a frequent element of insanity. Tamed, diverted, modified it certainly may be; but there can be no graver error than to suppose that, by any system of treatment, it may be utterly extinguished. And even if it were possible to eradicate this element of the disease, there remains another which should prevent us from relying too much on the discretion of the insane. The guiding, determining power of the patient—the balance-wheel, if I may use the figure, which regulates the mental movement—is generally more or less impaired, and some power must, to that extent, take its place. For this reason the patient is taken from home or his customary surroundings, where he is following the bent of his disordered fancies, and placed where his liberty of action is greatly curtailed, and his movements directed by others. To some, scarcely anything more is necessary than the unavoidable restrictions of the hospital. In others, the gravity of the disturbing element may call for the utmost amount of restriction at our disposal. In some shape or other, restriction is an essential element in all hospital management of insanity; but it would be preposterous to contend that just so much or so little is the exact measure best suited to all cases alike, or to any considerable proportion.

In the above remarks it has been my intention to indicate the only channels which the course of improvement can possibly take, and to state my reasons for dissenting from some current opinions on this subject. I am not disposed to anticipate only failure from the most skilfully managed experiments, nor to regard free and full inquiry in any direction as useless. What may be accomplished hereafter must be a matter of speculation, but probably the future will be much like the past. Men will continue to jump at conclusions, to imagine that they have found some royal road to the desired object, and that their own new ways are better than any old ones. One project after another will pass away, but not without leaving some pregnant suggestion behind. In the mean time, let us be less anxious to discover new truths than to turn the old ones to the best possible account, and then we need have no apprehension that the dark ages will return. The latter object is within the reach of all; the former is reserved for the gifted few.

The subject, which is of great importance, applies I think equally well to the large class of the chronic insane who are incurable and harmless and who, under the official inspection of the State Commissioner in Lunacy, could advantageously be treated in private families with the blessings and comforts of home life, and with important financial results to the commonwealth; and this would at once relieve our overcrowded lunatic asylums, and I think there would be a difference of a large per cent. in the expenditure to the State. Our present large and expensive asylums often require an investment of three or four thousand dollars for the accommodation of every individual patient, and *cures*, where such large masses of the insane are aggregated, and individuality and personality lost, cannot reach the same per cent. as when the physician can carefully and personally study and treat each individual case. In order that the system I

have spoken of should be efficient, the person taking charge of an insane patient in a private house should be required to cause the patient to be visited at least once a fortnight by the medical attendant; and the physician who makes the visit should be obliged at each visit to enter in a book, to be kept at the house, the date of his visit and also the state of health, mentally and bodily, of the patient, and the general condition and the circumstances of the patient and the house. A duplicate of this report should be forwarded by the physician to the State Commissioner in Lunacy or to the person delegated by him, or better yet to a regular district physician in lunacy, who could be appointed by the governor. The State could be divided into four or more districts, and a physician in lunacy appointed for each district by the governor. This board of physicians, who should be specialists in nervous and mental diseases, could constitute a lunacy commission to also visit and report as to the condition of lunatic hospitals, and protect the rights of those who are incarcerated in public asylums, and also strongly support the medical superintendents who, as a rule, exhibit skill and wisdom of the highest order. The public would feel more assured, perhaps, that no evils or abuses could spring up in our asylums, and also that if there is any room for improvement it will be immediately seen by the commission in lunacy if it escapes the superintendent's eye.

The Lunacy Commission of Great Britain has been of great benefit both to the officers and the patients of the English institutions, and would, I think, do the same in our own country, and would dispel the prejudice existing against our asylums and their managers. Such a commission in lunacy could also instruct the public as to the prevention of insanity, etc. *As there is a much-needed reform as to a new method of introducing expert testimony in criminal trials where insanity is alleged as a defence, this same lunacy commission might be of great value in examining such cases and giving testimony upon such trials, it having been provided in the statute by which such commission should be established, that the counsel for the prisoner in whose behalf the plea of insanity is proposed to be brought forward should be compelled to notify such board of such proposed plea. This board of experts should examine the prisoner's mental state, discuss the question, make their conclusions, and should take written memoranda of such examination. They then should appear in court at the trial, to testify as to the prisoner's sanity, or irresponsibility if they find him insane. I consider that this would be a very important medico-legal reform, as it would*

place rich and poor on the same footing if they were on trial for their lives, accused of murder. Of course, both the prosecution and defence could call in other experts, as now; but this lunacy commission report would be entirely impartial, and the public would know it to be so. All the factors tending to the commission of crime would be attentively weighed, and certain penalties would not be inflicted on the unhappy victims of diseased imagination.

Medical Treatment of Insanity.—The medicinal treatment of insanity consists in removing, as far as possible, all functional derangements of the system by attending to the proper performance of the functions of the body. We must relieve anæmia and hyperæmia of the brain so far as we are able, and treat symptoms as they appear in the course of the disease. Among the most valuable remedies for use in the treatment of insanity may be mentioned opium, hydrate of chloral, hyoscyamia, digitalis, ergot, the bromides of sodium, lithium, and zinc, tincture of cannabis indica, stimulants, and the use of prolonged warm baths, with cold to the head, and the galvanic current of electricity to antagonize the various congestive states in the incipient stages of mental diseases.

It is, I regard, a good practice in the therapeutics of insanity, to give 5 to 10 grains of calomel to begin treatment, followed by salines, which prepare the system for whatever after-treatment is indicated. For an overworked business man on the verge of insanity, whose whole system is probably disordered, in whom anxiety has caused loss of appetite and inability to sleep, and in whom the integrity of the nervous system has been gradually deteriorating for some time, as well as for patients whose conduct and conversation are beginning to attract attention, such an initial treatment as I have described, followed by the administration of 30 grains of bromide of sodium and 30 drops of tincture of cannabis indica thrice daily, in combination with warm baths at bedtime, cold affusions to the head, and galvanization of the brain—which latter controls the cerebral congestion—will be found by the profession, as I find it in the treatment of such cases, to be followed by prompt and gratifying recoveries. Many such patients are far better in their own homes, treated by this plan, than when carried away from home to an asylum, where, instead of *rest*, which is one of my great therapeutical reliances in early mental disease, the patient finds excitement and is apt to become worse. I do not at all underrate the good work done at our asylums by able superintendents by the foregoing remarks. Where there is exhaus-

tive mania, with high excitement and cerebral anæmia, wine or whiskey I have always found to be the best calmative and soporific. I have often induced and kept up sleep for hours by the administration of half an ounce or ounce of fine old whiskey; but I always give the whiskey with a carminative, so that the patient may not know what he or she is taking.

Food must be given regularly and systematically, to support strength and prevent exhaustion. A pulse of 150 will come down to 80 under this stimulative treatment in exhaustive mania, and a quiet, refreshing sleep and a good recovery will result. Rest, nourishment, *positive food*,—such as milk, eggs, beefsteak, lamb, well-cooked vegetables, and fruit,—sleep, and time, are all required for the cure of insanity. Restraint, I think, is grossly abused; and yet there are cases in which the camisole (a soft canvas jacket, which is all the restraint ever necessary in any case) is temporarily needed, but this should never be at the option of a nurse.

Opium has been called "the sheet-anchor of the alienist physician." The doses of opium require to be large, as the nervous system is singularly tolerant to large doses in acute mania and in some forms of melancholia, where it acts specifically by antagonizing the mental state of melancholia and depression, while in advanced dementia and general paralysis the experience of observers warns us to be careful in its employment. The dialyzed opium, which is of the same strength as laudanum, and the bimeconate of morphia are the best preparations to use. With either of these we avoid many of the unpleasant effects of opium in other forms. I commence with 20 minims of the London preparation of dialyzed opium, three times a day, and gradually increase the dose until one drachm or more is administered, three times a day. Guislain recommends large doses, but commences with 2 grains, which he increases to 10 or 15 grains as required. Drs. Bucknill and Tuke relate the case of a carpenter's wife who was affected with suicidal melancholia and was cured by the administration of large doses of morphia, and who was obliged to take 8 grains of the muriate of morphia daily. When taking this enormous dose she was cheerful and enjoyed good health, her tongue being clean and the pulse good, but when the dose was diminished she again became depressed.

I had recently a case of suicidal melancholia in the person of a young lady of New York, who became insane by reason of her lover leaving her and marrying another young lady of his acquaintance.

A fire broke out at night, in her home, at the time of the menstrual period, and she ceased menstruating and soon became maniacal. The family physician did all in his power for her, but finally sent her to me. Upon admission she was entirely incoherent except in her desire to commit suicide. She refused food, and had neither eaten nor slept for ten days previous to her admission. The tongue was dry, the teeth covered with sordes, and she was fast lapsing into typho-mania. I fed her sixty-three days, thrice daily, with the stomach-tube, using beef-tea, milk, milk-punch, etc., and, having thoroughly evacuated the bowels and washed out the kidneys with a diuretic, I put her on a treatment consisting only of prolonged warm baths daily, of half an hour's duration, at 100°, and the hypodermic use of morphia. I commenced with 5 minims of Magendie's solution, thrice daily, and gradually increased until I was giving 30 minims, thrice daily, and continued that dose for about thirteen weeks. She gradually improved, and at the end of four months had made a perfect recovery. I used the tincture of black hellebore as an emmenagogue, which restored the menses to their normal condition. Two years have elapsed since her cure, and she has manifested no symptoms whatever of a relapse, and, as there is no insanity in her family, I anticipate none in the future.

The *hydrate of chloral* has proved to be a very valuable remedy in the treatment of insanity, and also in delirium tremens, often procuring refreshing sleep, when all preparations of opium fail. It has been shown to be most useful in mania with sleeplessness and restlessness, in doses of from 15 to 30 grains, in combination with either hyoscyamus or morphia and sodium bromide. In delirium tremens the doses must be much larger, but half-ounce doses of tincture of digitalis with a half ounce of gin, have my preference in this latter disorder. As a therapeutic agent, chloral in doses of from 15 to 30 grains is an excellent hypnotic, causing sound and refreshing sleep, without the digestive disturbance which usually follows the use of opium. It is one of the sheet-anchors in our asylum. The great advantages that it possesses are, that it does not constipate the bowels, does not disturb digestion, the doses do not require to be increased, as is the case with opium, and the sleep produced by it resembles natural sleep more than that produced by most other narcotics. If pure chloral hydrate be used, it is one of our most valuable remedies, but as there have been many impure preparations sold in the market, and as the public have manifested

gross carelessness in using this dangerous—if abused—agent, there has grown to be an unreasoning prejudice against it. Chloral should always be freshly prepared, should not be kept for any length of time in a cork-stoppered bottle, and only preparations made by the most reliable chemists should be used, and finally, except in delirium tremens, it is rarely wise to give more than from 15 to 30 grains at a dose. The following is an excellent prescription to combat sleeplessness with maniacal excitement, and produces a long, natural, healthy sleep, from which the patient awakens refreshed and invigorated, and after a few repetitions on successive nights, the symptoms have disappeared or have been greatly relieved.

℞. Chloral Hydrate., ... ℈ij.
Sodii Bromid., ... ʒj.
Morphiæ Sulph., ... gr. ¾.
Syr. Zingib.,
Aquæ, āā . . . . . f ʒj.
M. et ft. Solutio. S. Tablespoonful at bedtime, to be repeated in half an hour if patient is not asleep.

In the daytime to produce quiet, the following pill is good:

℞. Zinci Valerianat., ... ʒj.
Ext. Belladonnæ, ... gr. jss.
M. ft. Pill No. xxx. Sig. Pill every two hours.

This is a very useful pill in general paralysis of the insane. The following is also a very excellent sedative mixture at night:

℞. Sodii Bromid.,
Chloral Hydrat., āā . . . . . ℥jss.
Dialyzed Opium (London Preparation), ... ʒv.
Fl. Ext. Gelsemii, ... ʒv.
Aquæ Dest.,
Syr. Aurantii, āā . . . . . q. s. ad ℥vi.
M. et sig. half teaspoonful in water.

Also the combination of 30 grains of chloral with a half ounce of fine old whiskey, or with two fluid drachms of tincture hyoscyamus, are excellent indeed to produce refreshing sleep.

Chloral having no influence over sensory nerves, has no power *per se* of relieving pain, and is therefore useless in that class of cases where opium is of such signal service. Chloral, weakening cardiac action, must not be given where we have any reason to suspect an

enfeebled state of the heart's action. Its physiological effects on the nervous system are, first on the brain and next on the spinal cord. Chloral produces an anæmic condition of the brain and thus causes sleep, by imitating the natural anatomical arrangement of that process. The reflex action of the spinal cord is much lessened, and the respiratory centre becomes weakened and eventually paralyzed. The vaso-motor system is enfeebled, but no special effects seem to be produced on other nervous structures, unless it is considered that any part of the loss of muscular power, sometimes observed in those who have taken chloral for a long time, is due to an action on the motor nerves. Perhaps this may be so. As regards the circulatory system, chloral has a powerful action on the heart, lowering and weakening its action by paralyzing its contained sympathetic ganglia. We should give chloral cautiously, and should bear in mind that strychnia stimulates the respiratory and vaso-motor centres in the cord, and thus opposes and counteracts the most dangerous tendency of chloral narcosis. Atropia also counteracts the cardiac and respiratory depression caused by chloral, as well as by morphia, which constitutes the danger of their use in man.

Hyoscyamia.—The therapeutical effects of this drug in acute mania are very important and valuable. Given hypodermically in doses of $\frac{1}{50}$ of a grain, it quiets restlessness and produces sleep with certainty and efficiency. Dr. E. C. Seguin has very well summed up the experience of all observers with reference to the physiological and therapeutical effects of this drug, and his conclusions as regards its use in insanity are, that hyoscyamia is indicated in mania, restlessness, delusions of persecution, dementia with agitation and destructiveness, epileptic mania, insomnia, rapid action of the heart, status epilepticus, chorea, paralysis agitans, hysterical spasms, neuralgia, tremor, etc. That in mania and allied states it produces sleep as certainly, or even more certainly, than chloral, without any bad effect, unless it be occasional gastric disorder. It is not claimed that its curative powers are great, but it is to be looked upon, Dr. Seguin thinks, as a narcotic, often speedier, more complete and less objectionable than morphia and chloral hydrate. I doubt very much, however, that it is in the main less objectionable, as I have known of one or two instances in which the $\frac{1}{100}$th of a grain has produced dangerous and almost fatal symptoms. One of the cases was the wife of a physician, who administered it himself and was much alarmed at the effect it produced. In acute mania, however, I

should certainly advise it, as I have seen very excellent results from it. I have used the solution Dr. Seguin advised, namely:

℞. Hyoscyamiæ (Merck's crystallized), ... gr. j.
Glycerinæ,
Aquæ dest., āā . . . . . m. c.
Acid. Carbol., ... gr. ss.
M. filtra. Sig. mj = gr. $\frac{1}{200}$.

Two minims a moderate dose; four minims a full dose.

The Bromides and Cannabis Indica.—One of the most charming combinations to reduce maniacal excitement with which I am acquainted, and one which I use a great deal, is a combination of sodium bromide, lithium bromide, and tincture cannabis indica,—15 grains of each of the former and 30 minims of the latter may be given three times a day, for a long time if necessary, with no ill effects. I premise the treatment with a mercurial cathartic, followed by salines, and the system is then freed from the often long-retained excrementitious matters, and is ready for treatment. Warm baths of a half-hour's duration of 98° to 100° are ordered at bedtime, with cold towels on the head. This mixture of the tincture of cannabis indica and the bromides of sodium and lithium should be made at the time of administration. It does not disturb digestion, it quiets the nervous system better, in most cases, than chloral or opium, and its long-continued use does not injure the patient at all. On the contrary, patients gain health, strength, appetite, and weight. The dose can be increased to ʒj of the bromides (30 grains of each, or 60 grains of one singly) and 60 minims of tincture of cannabis indica, if necessary, with no fear of evil results.

In melancholia, even in the worst cases, with suicidal impulses, I have had rapid cures from persistent warm-bath treatment, pills of aloes, and ox-gall and opium in gradually increasing doses. In puerperal insanity we have a condition of septicæmia from the absorption into the blood of some of the retained products of conception, and here a full dose of calomel will, in nine cases out of ten—if the insanity is not hereditary—start our patient on the road to recovery. It must be given at once, and be followed by salines and appropriate sedatives, and I have seen, in a few days, rapid progress toward recovery. In cases of hysterical mania, in young unmarried women, we often have at first, for a few days, a wild mania, and I have known some specialists give a very unfavorable prognosis, which was not

at all to their credit. These cases, if properly managed, are very curable, and if they are not cured, it is generally owing to the patient's being allowed to remain at home instead of being removed to some private institution. Fothergill's solution of hydrobromic acid, in half-drachm doses at bedtime after a warm bath, with cold to the head, and the monobromide of camphor (Clin's capsules), in four-grain doses three times a day, seclusion of the patient at once away from her friends, with a well-trained nurse, who will in moral treatment carry out your orders to the letter, will generally produce marked results.

In the worst case of hysterical mania I ever saw, I had my patient under the charge of one of the best-trained nurses at my disposal, and in a very few days she was down-stairs, and made a rapid and complete recovery. This case was pronounced incurably insane by a physician in charge of one of our institutions for the insane, and this assertion was made in my presence.

In these cases, where the emotional faculties are so involved, everything depends upon prompt seclusion and rest for the patient. I never treat such patients at home, but insist upon their being brought to me and placed under experienced nurses in my private hospital, and always see prompt recoveries. Within the past few days I have seen a case in consultation with my friend Dr. Nathan Bozeman, of this city, under whose able care the lady in question has been for some time. She suffered from prolapse of the uterus, and a prolapsed and imprisoned ovary. This condition had been skilfully treated and cured by Dr. Bozeman, but the patient's health having been undermined by the practice of self-abuse, she developed hysterical mania. She shuts herself up, will not go out, will not allow herself to be bathed, will not attempt to dress or undress herself, and the nurse spends several hours in performing these operations. She screams violently if any attempt is made to make her walk or to exert herself in any way. She is in fair flesh, and eats and sleeps well. The mother became perfectly exhausted by attendance upon this daughter, and has been sent away from home to preserve her own failing health. The family is rendered miserable by the continued hysterical insanity, and the first indication is evidently, in this case, to remove the patient from her maids and her relatives to seclusion and rest, and put her under the care of a quiet, determined nurse, who will follow instructions implicitly. A course of warm baths, actual cautery to the nape of the

neck, monobromide of camphor in four-grain doses of Clin's capsules three times daily, and Fothergill's solution of hydrobromic acid nightly, with the application of the constant or galvanic current of electricity to the central nervous system, will result in a speedy and complete cure in a short time. No anxious and sympathizing relatives are to be permitted to see her at all until a cure is well under way, or the good effects of treatment will be rendered futile.

I think it is only when these patients are allowed to be with their friends that their trouble becomes permanent, or where the physician does not understand the kind of case he has to deal with. About two years ago I was called in consultation to see a young New York lady with violent hysterical mania, the result of emotional excitement. I found her perfectly naked, the clothes having been pulled off probably as the result of a morbid hyperæsthesia of the whole body, and she was in a state of wild maniacal excitement. Upon consultation, it was decided to remove her to my private hospital, where she was placed under one of my best nurses, who kept her in strict seclusion for about a week, while the treatment I have before detailed was faithfully carried out. She made a good recovery, and at the end of four months went home perfectly well, has never suffered any relapse, and has since married happily, and enjoys excellent health.

Digitalis.—The use of digitalis has been advocated by Dr. Lockhart Robertson and by Dr. Duckworth Williams, his successor at Hayward's Heath, England. They claim that digitalis is a valuable sedative in both recent and chronic mania, and also when these forms of insanity are complicated with general paresis and epilepsy. The dose they employ ranges from half a drachm to one drachm of the tincture, this dose being continued for some days and then gradually decreased. Stimulants are necessary to ward off the dangerous exhaustion which accompanies or follows acute maniacal excitement, and are contraindicated only where there is excessive plethora.

Conium.—Conium in insanity, in doses ranging from ♏ xx. to a drachm of the fluid extract, will produce general muscular relaxation, and, subsequently, quietness, followed by calm and refreshing sleep, the whole motor-nerve system being quieted. The influence of conium is upon the motor centres of the brain, the corpora striata being chiefly affected. It quiets irritability and excitement of the motor centres and leaves no feeling of weakness or oppression behind, and is therefore very valuable in certain cases of mania. The pulse

and temperature are both reduced, and a gentle perspiration covers the whole body as soon as the physiological effects are produced. Among the physiological effects may be noticed dimness and confusion of vision, muscular weakness, slowness of mental processes, a feeling of calm tranquillity, lowering of pulse and temperature, and finally, refreshing sleep, followed by no disagreeable after-effects. Conia, neutralized by acetic acid to prevent irritant effects, may be used hypodermically in doses of from one-tenth to one minim, and as it acts upon the purely motor centres, and as morphia acts as a sedative to the sensori-motor and ideo-motor centres, a combination of the two, using the tartrate of morphia in solution with the conia, acts very well in reducing maniacal excitement, and is a valuable remedy, especially in aggressive outbursts of excitement in the excited wards of asylums, or where danger is threatened in the home treatment of the insane. Caution must be used in using new specimens until their strength is ascertained. Conia should be prepared from the seeds of the uncultivated plant.

Ergot in the Treatment of Insanity.—It was proved years ago, by the researches of Brown-Séquard and others, that ergot possessed the power of producing contraction in the vessels of the spinal cord, and it accordingly occurred to Dr. Browne, of the West Riding Asylum in England, that it might possess a similar control over the vessels of the brain, and thus be made to modify or remove the active cerebral congestion which is an attendant upon so many phases of insanity. Upon a thorough investigation, he found that there were three varieties of insanity in which it was eminently useful, namely, recurrent mania, chronic mania with lucid intervals, and lastly, epileptic mania. Dr. Browne and other observers, who have adopted the use of ergot in the treatment of insanity, have found that in the varieties above mentioned it was uniformly successful in reducing excitement, in shortening the attacks, in widening the intervals between them, and sometimes in preventing their recurrence entirely, and in warding off the dangerous stage of exhaustion by which maniacal excitement is so often succeeded. The way in which ergot operates upon the contractile coats of the vessels has been proved to be by its influence upon the non-striated muscular fibres and cells contained in their coats, thereby exercising a controlling power over the calibre of the intracranial vessels. In the three varieties of insanity before referred to,—in recurrent mania, in chronic mania with lucid intervals, and in epileptic mania,—we find that the lesion con-

sists essentially in cerebral hyperæmia. We find, although the symptoms differ in these three forms of mental disease in which ergot is useful, that there is present in each form increased arterial pulsation, flushing of the face, suffusion of the eyes, dryness of the mouth, and cephalalgia. The disappearance of these phenomena in the intervals of the paroxysms proves that they are dependent upon functional and not organic changes in the brain, in which latter case we should not expect to find any marked efficacy from the use of ergot, and, indeed, we often meet with instances in which the controlling power of ergot is, after a time, lost, as organic degeneration gradually follows as a sequence upon repeated attacks of mania. In epileptic mania, it will be found that a combination of bromide of sodium with ergot will materially aid the action of the latter in widening the intervals between the fits and in modifying the attacks when they occur. This combination will also often arrest paroxysms in the incipient stage. The stage of excitement which often precedes and ushers in the attack, and which sometimes succeeds it, is markedly diminished by the combination of bromide of sodium and ergot. The bromide of sodium will be found to be preferable to the bromide of potassium, as it is pleasanter to the taste and causes less constitutional disturbance than the latter when given in large doses.

Dr. Browne remarks that "it is in epileptic mania that ergot has been found pre-eminently valuable, in allaying and abolishing excitement and in conducing to a healthier tone of mental action. In the outbursts of violent agitation which precede or follow a fit or group of fits which occasionally take their place, and which have been pronounced by all authorities to be of so dangerous a character, it exerts a prompt and energetic effect. We may presume that these outbursts are dependent upon a want of equilibrium in the intracranial circulation, primarily disturbed by the epileptic seizure or condition. The distension of the vessels which succeeds their spasmodic contraction and produces coma, subsides so far as to allow the resumption of activity by the higher centres, but only in an irregular and disturbed way. And we may presume, further, that the soothing and rectifying effects of ergot are due to its power of re-establishing that disturbed equilibrium. A thorough trial of the ergot treatment has satisfied me of its efficacy, and the following clinical cases will serve to illustrate its beneficial action. The doses of ergot used in the following cases have been from ℥ss. to ℥j. of Squibb's fluid extract, three times a day, and in cases in which ergotine has been employed,

from 5 to 10 grains have been given. No unpleasant effects have ever followed even prolonged administration of the ergot, and from our experience with it, it would seem that the danger of injurious effects from its continued use has been greatly overrated by the majority of the profession.

Dr. Browne, who has used the ergot treatment for many years in many hundreds of cases, says: "Indeed, so little have injurious effects of any kind followed even the prolonged exhibition of what might be termed enormous doses of ergot, that doubts might have arisen as to whether it were possible to produce that train of symptoms described as ergotism, by means of the medicinal preparations of secale cornutum."

Case I.—Miss ——, with recurrent mania, aged 22 years, was very noisy and maniacal when first seen; was very incoherent in speech and boisterous, and had no realization of her condition or surroundings. She entertained the idea that people were trying to kill her and get her property. She destroyed her clothing, broke the windows, did much damage to the furniture, and imagined that she saw snakes and devils in her room at night. She continued in this state for some time with no mental improvement. She commenced by my advice to take the fluid extract of ergot in ℥j. doses, three times a day, and had only taken a few doses before beneficial results were very apparent. The excitement subsided, and she became quiet and peaceable. The congestion of the head and face, which was very marked, has nearly entirely disappeared. Her pulse was reduced from 145 to 90. The temperature in the axilla from $99\frac{5}{10}°$ to 98°, and her tongue, which was thickly furred, presents a normal appearance.

Case II.—Miss M. K., aged 28 years, who suffered from chronic mania with lucid intervals. She was very violent and abusive, would bite and strike her nurses. Her face was deeply congested, eyes injected, tongue coated with a thick white fur, pulse 130, and temperature 99°. Having continued in this excitable state for some days with no evidence of improvement, was ordered ℥j. of the fluid extract of ergot, three times a day. By the 24th of June she began to show decided signs of improvement, and in place of being filthy and abusive in language and conduct was polite and neat in her habits. She also began to sleep at night, which she had not done before, although medicine had been given for that purpose. Her pulse was lowered to 85. Her temperature decreased, the suffusion of the eyes

disappeared, and at the present time she has had no relapse of maniacal excitement.

Case III.—Mr. E. Z., a native of Germany, aged 27, was, when I first saw him, suffering from an attack of acute mania caused by overwork and mental anxiety. Had always been a healthy man, and there was no trace of insanity in the family history. He was noisy and maniacal. He was ordered a warm bath, which relieved him for about half an hour, when he again became maniacal and dangerous. Was given chloral and hyoscyamus, and passed a restless night. In the morning he presented very much the same appearance as on the preceding evening. Face and eyes suffused and congested, pulse 100, and temperature heightened; tongue thickly coated, and mouth dry; was put on ℥j. of the fluid extract of ergot three times a day, with chloral and hyoscyamus at night. In a few days the excitement began to subside, and in less than two months he was comparatively quiet, and in fifteen days more the pulse was 80, the temperature was $97\frac{8}{10}°$, and the appearance normal. Has remained quiet up to the present time, with good appetite, sleeping well, and very cheerful.

Case IV.—Miss S. H., aged 25, was suffering from epileptic mania. From September to June she had a great many epileptic seizures, which were preceded and followed by attacks of maniacal excitement, which rendered her a dangerous patient. In July she became very noisy and excited, as was her habit before her fits, threatening to kill her nurse and those about her. Her eyes were suffused, the mouth dry, the pulse 140, and the tongue furred. She was put on ℥j. doses of fluid extract of ergot, three times a day. After taking the ergot for two days she became quiet, and the epileptic seizure which followed was very mild as compared with preceding ones. The ergot was continued, and since that time she has had no return of the maniacal excitement. The fits have decreased in frequency and intensity, and are not followed as formerly by any mental excitement. Her physical condition has also been markedly improved since she has taken the ergot. The pulse is 75, and the temperature in the axilla 98°, and she eats and sleeps well.

Case V.—Mr. C., aged 30, was first seen with epileptic mania. He was a strong muscular man and had been subject to epileptic fits for some time. For a period of from a week to two or three days preceding the fits was entirely unmanageable, and a very dangerous man to deal with. He was also accustomed to have a period of

maniacal excitement following the epileptic seizures, which lasted for a variable period, during which time his pulse would range from 100 to 120, and the face would be deeply congested. Was put on ℥j. doses of fluid extract of ergot, three times a day, and this dose continued for a period of two months, sometimes omitting the medicine for a week and then resuming it. The fits immediately decreased in both frequency and intensity, and the maniacal excitement entirely disappeared. Pulse and temperature became normal, and he made a very good recovery. Several other cases of mine have exhibited as marked improvement under the ergot treatment as the foregoing, but want of space forbids their insertion.

Last, but not least, may be mentioned *the use of warm baths*, which are of inestimable value in the treatment of nervous and mental diseases. The tranquillizing effect of a warm bath in relieving cerebral irritation and in promoting sleep, especially when conjoined with cold to the head at the same time, either by a wet towel or still better by cold affusions, is often wonderful after all other means have failed. Patients with excessive maniacal excitement, hot head, dilated pupils, tongue thickly furred, and a high temperature in the axilla, have repeatedly passed a comfortable night, after having remained for half an hour in a warm bath at a temperature of 100°. In acute mania, baths prolonged for some hours, with cold to the head, have accomplished wonderful results. This, in connection with a dose of chloral and morphia or hyoscyamus, will often suffice for the relief of acute mania if repeated on successive nights, if good refreshing sleep can be induced. Enough has been said, however, to show clearly that we can lay down no definite plan of treatment for any number of cases, but must in every instance, if we expect to accomplish a cure, study the constitution and idiosyncrasies of our patient and treat him accordingly. By so doing, we shall often have the satisfaction of seeing apparently hopeless cases restored to society, and families rendered happy which had been broken up by the visitation of this fearful disease.

Cases Illustrating the Treatment of Insanity.—Case I.—Mr. ——, aged 30; a native of England. When first seen was suffering from acute mania, resulting from abuse of alcohol. No insane relations. Said he left England to get rid of his wife, who tormented him. Said he knew he was insane when he left, but that destitution and hard drinking had made him worse. Toward night became acutely maniacal and very boisterous. Tore up everything within reach, and was incoherent and vulgar in speech. Had no appreciation of his

condition or surroundings. Quoted almost continually from Shakespeare and showed that he had received a liberal education. Said he burned Spurgeon's Tabernacle. Eyes suffused and pulse full and bounding. Was ordered warm baths every night, lasting half an hour, with cold affusions to the head, with chloral and morphia at bedtime, the dose of chloral being twenty grains, combined with one-fourth grain of morphia. He was fed liberally, and as he was always quiet in the morning was ordered fluid extract of ergot in ℥j. doses, twice every afternoon when he became excited. Under this treatment he quieted down and soon began to appreciate his condition and take an interest in his surroundings. He improved gradually and made a good recovery.

Case II.—Miss ——, aged 39. Was, when first seen, suffering from melancholia, resulting from syphilis. She was uneasy and restless at night and would get out of bed, suspicious of injury from unseen persons, who, she said, were anxious to kill her. Was depressed, melancholy, and very suspicious of all about her. Imagined her food was poisoned. Complained of great pain in her head, and was pale and anæmic. She ate and slept but little. Was put on a nourishing diet, with milk punch, and was given the bichloride of mercury, in one-fifth grain, and the iodide of potassium, fifteen grains three times a day, with tincture hyoscyamus ℥j., and 20 grains chloral hydrate at bedtime. Upon this treatment her general health improved very much. She began to eat and sleep, but would sit alone all day and cry over imaginary troubles. She improved slowly but surely; her delusions gradually disappeared; she became more cheerful and happy, and made a good recovery. This is a very interesting and unusual case, as syphilitic insanity is a very rare disease, some authorities claiming that not more than one or two per cent. of all cases present this complication. The most frequent form of syphilitic insanity is dementia.

The above-mentioned case was probably the result of a simple irritation of the central nervous system due to the cerebral anæmia caused by the syphilitic virus. In another case the symptoms occurring in a young gentleman were profound mental dulness, incapacity to grasp thoughts and ideas, a desire to commit suicide, and symptoms of compression of the brain, due, I presume, to the thickening of the dura mater by a gummatous deposit. Mercury and large doses of the iodide of potassium effected a cure. Another case, where a clear syphilitic history was obtained, occurred in a woman aged 29,

a native of France, with no insane relations. This patient's limbs were covered with secondary sores and the head was affected with gummy tumors. She soon passed into most profound dementia, associated with epileptiform convulsions. She was treated with a combination of mercury and the iodide of potassium, but remained a case of chronic dementia, defying all treatment. As I have before remarked, as the results of the cerebral congestion of specific origin, we have vertigo and dulness, temporary disorders of the special senses and momentary impairments of the intellect, and these symptoms lapse from transitory into permanent symptoms. Persistent mental dulness, and muscular feebleness exist as vague undefined symptoms before the invasion of actual insanity, with headache followed by exaltation, delirium, and mania, which rapidly lapse into dementia, or we may have a primary dementia without the stage of mania.

Case III.—Mr. ——, aged 25 years; single. When first seen was suffering from melancholia, bordering on dementia, caused by intemperance and vicious indulgences. He denied insanity in the most positive manner, but complained of severe pain at the back of his head and over the frontal region. The faculties of the mind were much enfeebled. Would burst out laughing and laugh incessantly for some minutes, and upon being questioned subsequently had no remembrance of doing any such thing. Had a delusion that he had been reduced to half his size by divine assistance. Saw visions at night. Was feeble and anæmic. Had attacks of mental excitement about once a fortnight, in which the bodily temperature would be much increased and the eyes suffused. At such times was very homicidal in his impulses, requiring, often, seclusion in his room. Was put on nourishing diet and tonics, the most valuable of which was my favorite tonic, the chloro-phosphide of arsenic (Routh's formula), in ten-drop doses, after each meal, with fluid extract of ergot ℥j., three times a day, and warm baths at bedtime, when he could not sleep. There was no perceptible mental improvement for some months, but the general health was much improved and he slept much better. The attacks of cerebral congestion decreased in frequency and intensity, and finally ceased altogether. His sleep ceased to be disturbed by visions. His appetite became good, his mental faculties began to be restored to their normal state, and his delusions disappeared. He made a good recovery, with no trace of insane ideas or delusions, his conduct for some months having been reasonable and

quiet. It is proper to mention that the ergot in this and other cases was never continued for more than two or three weeks without suspending its use for a week or two, and using it in this way no injurious effects have ever followed its employment.

Case IV.—Mr. C., aged 26 years; single. Was first seen suffering from an attack of acute mania, the result of ill-health and overwork associated with intemperance. Upon admission was thin and anæmic and was rambling and incoherent in speech. Said he was married to the Queen of Heaven. Was sleepless; ate but little and was very destructive in his impulses, tearing up clothing, etc. The eyes were injected and the pupils widely dilated. Was given bromide of sodium in fifteen-grain doses three times a day, which was increased to twenty grains, with full doses of chloral and tincture hyoscyamus at bedtime. Full nourishing diet. Soon became quiet and polite, and with the increased health and strength his mind became normal and his delusions disappeared.

Case V.—Mr. F., aged 23 years; single. Was suffering from an attack of recurrent mania when first seen. He was depressed and sullen and would not answer questions. His tongue was thickly furred and the bowels constipated. He was ordered a laxative and warm baths at bedtime, as he said he did not sleep well. In a few days the eyes became injected, the pupils dilated, head hot and speech wild and incoherent and movements restless and excited. Said he had a worm inside him that was eating him up. Thought the food was poisoned and refused to eat. Was ordered warm baths, fluid extract ergot, in one-drachm doses, three times a day, and chloral, 20 grains, combined with one-quarter grain of morphia, at bedtime. In a few days the cerebral congestion abated, and he went on until the next month when he had a recurrence of the mania, which was preceded a few hours, as before, by melancholia and constipation. The same treatment was employed and the maniacal attack lasted but twenty-four hours. The ergot was continued through the lucid interval, and was discontinued at the end of four weeks, as he had no symptoms of another attack. He remained well until January, 1875, when he had a recurrence of the mania, which was treated as before, with the addition of bromide of sodium, in 20-grain doses, three times a day. This was his last attack. He improved steadily in health and strength; his delusions disappeared, he began to show an interest in his surroundings, and made a good recovery.

Case VI.—Miss N., aged 20 years; single. Was suffering from an

attack of acute mania when first seen. Previous to this attack she had been a remarkably well-behaved and quiet girl, and had been reasonably healthy. She was acutely maniacal, with rapidly changing delusions. Saw devils, snakes, and angels, in rapid succession, and said the Virgin Mary visited her every night in her room. Pulse rapid, tongue thickly furred, bowels constipated, and eyes injected, with the pupils dilated. Destroyed everything within her reach. The display of muscular strength which she exhibited was something remarkable. She was put in warm baths, with chloral and morphia internally at bedtime, but did not sleep. Refused food and was so violent that the attempt to feed her artificially was for the time abandoned. None of the usual remedies seemed to quiet her in the least, and she seemed likely to die of exhaustion from the violence of her mania, when she was ordered the monobromide of camphor (Clin's capsules, made in Paris), in doses of four grains three times a day. This remedy acted charmingly. After the third day's trial the temperature in the axilla became reduced from 102° to 99½°. The pulse was reduced in frequency and the suffusion of the eyes disappeared. The pupils were reduced to their normal size. She began to sleep and eat, and at the end of ten days was quiet and tranquil. The doses were reduced to two grains three times a day as the mania decreased, and were continued for about a month. The mental faculties improved, the appetite returned to its normal condition, she began to take exercise in the open air, and finally made a good recovery. From my experience with the use of the monobromide of camphor (Dr. Clin's imported preparation), I believe it to be an excellent sedative of the cerebral system, and at times a decided hypnotic. In epilepsy and hysterical mania it has acted as a nervous sedative and antispasmodic, with good effects, in doses of from two to four grains, three times a day.

Case VII.—Miss G., aged 18 years; single. Was seen suffering from acute mania. Was noisy and boisterous and a dangerous patient. Was homicidal in her impulses. The pupils were widely dilated; head hot, and she complained of intense pain in frontal region at times. Was incoherent in speech and had no appreciation of her condition and surroundings. Was thin, and ate and slept but little. Was ordered warm baths at a temperature of 100° every afternoon, and cold affusions to the head, at the same time with chloral and morphia at bedtime. She was also given thirty grains of the bromide of sodium twice a day. In a short time she became quiet and re-

mained so for three months, during which time she had various delusions and retained her homicidal impulses. At the end of that time she became acutely maniacal, and was put on fluid extract of ergot and warm baths, with cold applications to the head, and chloral and hyoscyamus, in full doses, at bedtime. In a week she began to improve, and her appetite, which had been poor since her admission, became good. She realized her situation and thanked the doctor and her nurses for their care of her. She no longer wished to injure those about her and continued to improve daily. Her insane delusions totally disappeared, and she has made an excellent recovery and has had no relapse.

Case VIII.—Miss K., aged 24 years; single. When first seen was suffering from suicidal melancholia, and had a great many delusions of fear and persecution. Said that everybody wanted to kill her, and so she had better kill herself. Got very angry at trifles, and swore, and struck those about her. Had no appreciation of her mental condition. Was put on a full nourishing diet, with dialyzed opium (London preparation, same strength as laudanum) in gradually increasing doses, and warm baths, with bromide of sodium (30 grains) at bedtime. She was kept on this treatment for some weeks, with gradual improvement. The dialyzed opium was carried to the extent of 60 minims, three times a day, with excellent effects. The appetite was stimulated, and she became cheerful and realized her condition and surroundings. She slept well, and the desire to commit suicide disappeared. The amount of opium was gradually decreased as the mental condition improved, and was finally withdrawn altogether. She made a good recovery.

Case IX.—Miss M., aged 24 years; single. Was first seen suffering from acute mania. Was very much excited, eyes injected, and pupils widely dilated. Head hot and face flushed. Had slept none for a week, and had eaten nothing for the same length of time. Was given a warm bath, and milk-punch, and, at bedtime, 20 grains of chloral, with one-fourth grain of morphia. Slept part of the night. The next day she was maniacal, and imagined all her food was poisoned. Was fed on milk-punch, and had a prolonged warm bath, with the chloral and morphia repeated at bedtime. She slept better than on the preceding night. During the next three weeks the same treatment was persisted in, resulting in gradual improvement. She retained the delusion respecting the food. She had new attacks of mania, recurring about once in three days, at night, when she

would see visions of angels, etc. She was put on fluid extract of ergot, 60 minims, thrice daily, with decided improvement. She improved rapidly. Began to eat all that was given her, slept quietly all night, and soon made an excellent recovery.

Case X.—Mr. B., aged 36; occupation, architect. When first seen was suffering from acute mania, which followed repeated attacks of delirium tremens. Nervous system very much broken down. Thin and anæmic, with poor appetite. Slept but little. Was put on a nourishing diet and pills of phosphate of zinc with the extract of nux vomica (nine-tenths of a grain of the former and one-fourth grain of the latter), thrice daily. Also, pepsin and bismuth before meals, as the digestion was impaired. He had warm baths, and chloral and hyoscyamus in full doses at bedtime. He soon began to improve. The hallucinations of sight and hearing with which he had been affected disappeared. The general health improved, and in two months from the time when he was first seen, made a good recovery, having gained markedly in flesh.

Case XI.—Mr. P., aged 16, was seen in a state of great exhaustion from acute mania, threatening death. Tongue and lips dry and black, eyes deeply injected and pupils widely dilated. Had not eaten nor slept for over a fortnight. Was acutely maniacal, although so much exhausted. Was put to bed and given a full dose of brandy, which was followed by a dose of chloral and morphia. He slept part of the night. The next day he was freely stimulated and fed with beef-essence, and eggs beaten up raw. This treatment was followed up for a week, with chloral and morphia at bedtime, with the happiest results. He became quiet and slept well. The sordes disappeared from the teeth and tongue, and he asked to see his mother, and recognized her. Talked incoherently for some time, but realized his condition and surroundings in his lucid intervals. Was put on phosphide of zinc, in one-tenth grain doses, three times a day, with good results. The appetite increased, the mental faculties improved, and he continued to convalesce, and made a good recovery. The cause of the insanity was thought to be the immoderate use of tobacco, which acted very injuriously upon a defective organization and weakened nervous system, inherited from his father, who was an intemperate man and died of phthisis.

Many more cases might be noted, but want of space forbids their insertion. Phosphorus and the chloro-phosphide of arsenic (Routh's formula, the imported preparation) have been largely used by us in the

convalescence in mental disorders, and also cod-liver oil and quinine in 2-grain doses. The foregoing cases illustrate the necessity of repressing cerebral excitement; inducing sleep, by which the brain-cells are renovated; and restoring the functions of the body, which are often disordered in mental disease. In addition to these measures, if we provide cheerful surroundings, new objects of attention and interest, and can induce a healthy train of thought, we shall very often have the pleasure of seeing our patients make a good recovery.

The Varieties of Insanity in Relation to Treatment.—The general practitioner should bear in mind that with him rests a great responsibility, as it is during the early stages of insanity that he, if intelligently informed as to mental disorders, may successfully check their progress or ward them off. He should, therefore, carefully study and recognize every deviation from the healthy mental standard of disease, indicating the necessity for medical treatment and advice, and it is to be hoped that, in the near future, no medical college shall be granted a charter which does not provide a chair for instruction in mental diseases, with especial reference to their early diagnosis, and to the therapeutics of insanity by practical alienists. Of what immense advantage to the profession would it have been had they been able, during the past twenty-five years, to have had the theory and practice of psychiatry expounded to them, both in colleges and in the wards of our insane hospitals, by such men as the late Dr. Ray, Dr. Kirkbride, Dr. Pliny Earle, and many others, who are sound, practical psychologists and alienists. How can a man ignorant of the first principles of psychological medicine intelligently sign a certificate of insanity consigning a human being, perhaps for life, to an insane asylum? There is no disorder of mind without disorder of brain, and it is the great medical evil of the day that at present, in our medical colleges, very little attention has as yet been paid to the study and treatment of such disorders. The profession and medical students have a right to demand that, as they as medical men will be required by the legislatures of the respective States in which they practice medicine to sign certificates of insanity, and that as to their care will be committed many in the early, curable stages of insanity, they shall be taught in medical colleges, by a special professor:

1. The healthy functions of a healthy brain; the structures which form the cerebrum; the nerve-cells and nerve-fibres; the *neuroglia*,

in which the cells are imbedded, and the bloodvessels and lymphatics. The nerve-cells are gathered together in the great nerve-centres, and, as an electrical battery sends the current of electricity along the connecting cord to the electrode, so, in like manner, by means of the nerve-fibre, does the nerve-cell communicate with the organs of special sense, with the sensory ganglia and spinal cord, with each other, and, finally, with the nerve-cells of the convolutions of the other hemisphere. The phenomena of healthy mind include sensation, feeling, and consciousness. These the student may study subjectively, and then he will be prepared to be taught objectively,

2. The abnormal functioning of an unhealthy, diseased brain. Respecting the subjective study, the remarks of the great philosopher Seneca are very appropriate, where he says: "What does it profit us to master our appetites without understanding the *when*, the *what*, the *how*, and other circumstances of our proceedings? For it is one thing to know the rate and dignity of things and another to know the little nicks and springs of action." Seneca also truly said: "Philosophy is the health of the mind. Let us look to that health first," etc. Of such a one (a philosopher) he says: "He studies to fill rather his mind than his coffers. His life is ordinate, fearless, equal, secure. He stands firm in all extremities, and bears the lot of his humanity with a divine temper." I fancy that a thorough study of this great philosopher might not be utterly inappropriate to those who desire to understand and master the hidden springs of human action, and that an acquiescence in his teachings might, by teaching us how to best master our hopes and fears, how to tune our affections and keep ourselves constant to ourselves, how to measure our appetites so as to know when we have had enough, and by making us understand that "the good of life does not consist in the length or space, but in the use of it," operate in the direction of the prevention of much insanity. Seneca was a wise psychologist when he said: "Let us rather study how to deliver ourselves from sadness, fear, and the burden of all our secret lusts. Our duty is the cure of the mind rather than the delight of it; but we have only the words of wisdom without the works, and turn philosophy into a pleasure that was given for a remedy." Could the masses be taught to govern their hopes and fears, their anxiety of thought and their perpetual disquiet, there would soon cease to be an increase of insanity disproportionate to the increase of population, as now exists, and observance of hygienic laws would soon become a matter of habit.

Respecting the phenomena of diseased mind or unhealthy brain function, the student will learn that there may be impairment or cessation of nerve-function, and that this is generally ushered in by sleeplessness and marked nervous exhaustion; that there is a prodromic period, marked by distinct psychic signs, during which period there is a defective generation and supply of nerve-force. He will be taught clinically that there is often an initiatory stage of depression before a maniacal attack. He will also be taught that there is very often cerebral hyperæmia, evinced by a hot head, sleeplessness, cephalalgia, flushed face, and injected conjunctiva. A person may not sleep or even eat for some days while in this condition. Clinically he will see, in the wards of an insane hospital, the gloom of *melancholia;* the delirium, violence, excitement, and incoherence of *mania;* and the silly, vacant, meaningless behavior of the patient with *dementia.* The *melancholiac* may evince much distress, will be full of gloomy forebodings, will have a great weariness of life, and very likely will have attempted self-destruction. He will be told that the patient's bowels are torpid, and that very likely there is lithæmia. The treatment very likely has begun with an aloetic and mercurial cathartic, and this may have been followed by a course of warm baths and opiates, and in a few months the insanity, if not hereditary, will have yielded to this treatment, and the patient have returned home cured.

The *maniacal* patient will be violent in conduct, abusive in language, and angry and wilful, perhaps very obstinate. There will be great restlessness and delusions, and perhaps he may have been homicidal. The head may be hot and the conjunctiva suffused, and the muscular movement violent. Or the head may be cool and the pulse small and quick. In such a case a mercurial cathartic may have been used to prepare the system for further treatment, which may be ether ℥j.; tincture opii ♏. xxx. to xl., ter die. Under the influence of this treatment, the patient may have improved rapidly, with good food and plenty of fresh air and occupation. In this case, also, very likely the prolonged warm bath with cold to the head for half an hour, has been frequently used. The case of *dementia* with a weak mind, and who has been foolish and irritable, and inattentive to the calls of nature, and mischievous, and whose memory seems quite gone, has been treated by tonics, and perhaps the chloro-phosphide of arsenic in 5-minim doses ter die, and gradually decreased, and perhaps has had croton oil rubbed on the shaven scalp. Under

this treatment she may have made a good recovery, particularly if the dementia has followed some exhausting and prostrating disease.

The student will be told that in sthenic mania, the continued warm bath of from half to one hour or more, with cold to the head, the administration of a mercurial cathartic, the induction of sleep, occupation and exercise in the fresh air, and *time*, will often effect a cure in apparently very unpromising cases; while in asthenic cases, stimulants are well borne, and are necessary with tonic treatment. He will learn in the wards of an insane hospital, what is perhaps new to him, that opium is the physiological antagonist to the psychical states of gloom and despair, with suicidal tendencies, seen in melancholia. He will also learn that the lucid interval of chronic mania is very far from the recovery it sometimes appears to be, and that the case of reasoning mania, who has committed some crime, exhibits not the slightest remorse, such as a sane person would suffer from. That such a patient is very plausible, cruel, treacherous, lies on all occasions, whenever it serves his or her purpose, and always justifies the acts performed and considers them quite praiseworthy. The intellect seems quite acute, and the patient probably roundly abuses those who are working for a cure, and is considered as the mischief-maker of the ward of which he or she is an inmate. No treatment will avail in this case, as the student of psychiatry will be told that there is here a congenitally diseased brain, with a total absence of all moral sense—a true moral imbecility. The feelings and moral sentiments have been affected in this case, the emotional insanity finally taking on a destructive character. This patient will have been the scourge of his or her family from childhood. This is a case of moral or emotional insanity proper, with an exalted emotional condition. The affections and dispositions are perverted. Dementia may appear as the patient advances in years, and the insane hospital is the only safe and proper place for such a one. Of the various forms of insanity in relation to treatment, we have shown the student the clinical phases of mania, melancholia, dementia, and moral insanity, or reasoning mania.

General Paralysis of the Insane.—We shall see the general paralytic, or case of *paralytic dementia*, exhibiting a general and progressive loss of co-ordinating power over his muscles (we shall rarely see a female with this disease), and exhibiting clinically a mental feebleness bordering on dementia. The poor fellow, who is doomed, probably, for this is one of the most incurable forms of insanity, will

tell us that he feels in perfect health, is worth millions, and has other delusions of grandeur. As he is talking, we notice the tremor of his lips and tongue, and as he walks we see that his gait is very uncertain. As we look closely at him, we see that his pupils are unequal, but this condition may be present or absent. The motor, sensory and psychical functions generally are performed sluggishly, and paralysis of the sphincters comes on and the patient dies of exhaustion. The patient may have had maniacal attacks during his illness. If he is inclined to be excitable and restless, we may give him a combination of chloral, sodium bromide, and morphia at night, with a pill every two hours of valerianate of zinc and belladonna, and cold baths with central galvanization. This may relieve symptoms very markedly, and in the early stages may possibly do more than this, but the prognosis is very gloomy indeed. The evening temperature is always higher than the morning. We may diagnose this disease by the thermometer, as the rise will be seldom less than 1°, and in destructive cases may be as high as 2°.

Epileptic Insanity.—We shall find this patient presenting a history like the following: There will be a maniacal attack accompanying the fit, lasting for a few hours, and it may appear again after the fit any time within a few days. There are likely to be instantaneous acts of violence committed by this patient, and especially in non-convulsive cases. The higher the epileptic excitement the less likely is the patient to be dangerous, as the morbid impulses towards homicide more frequently accompany the milder attacks, where the patient is apparently very mild and tractable. There is an unconsciousness of acts performed, as there is unconsciousness in all true epilepsy. There is vertigo, injection of the conjunctiva, dilatation or alternate dilatation and contraction of the pupils, and a slow respiration. The temperature may be below the normal, except about the time of the paroxysm, when it becomes heightened, as does the pulse. There is, sometimes, a heavy drunken sleep before the return to sanity and consciousness.

It is extremely important, from a medico-legal standpoint, to remember the violence and the unconscious states of epileptics, and the existence of temporary mental disorders occurring after epileptic paroxysms. The mental condition of epileptics has received too little attention. The best treatment in these cases has seemed to us to be a combination of sodium bromide, 30 grains, and fluid extract of er-

got ℥ss. to ℥j. ter die, occasionally intermitting the treatment, with plenty of outdoor exercise and carefully regulated diet.

Insanity of Pubescence.—This form of mental disease resembles in its clinical features moral or emotional insanity proper, and rarely comes under treatment, as the parents fail to recognize the case as one of insanity. The great diagnostic mark is here the abnormal mental condition occurring during the evolution of the reproductive system at the time of pubescence. The treatment of the case if fortunately recognized as disease instead of depravity, should be mainly moral, with quiet and rest.*

Insanity from Masturbation.—These cases exhibit, clinically, delusions of fear and persecution, while the manner and conversation is pretty normal. The extremities are apt to have a cool, clammy feel. Such cases are sulky and disagreeable in the wards of an asylum, and we shall notice an evasive look in the face, and a failure of the patient to look you squarely in the eyes, and that he seems afraid. The prognosis is very gloomy. They are apt to be incurable cases. A combination of quinia, 1 grain, strychnia, $\frac{1}{60}$ grain, with the compound tincture of gentian, ter die, is the best tonic. These cases tend to become demented.

Nymphomania and Hysterical Insanity.—These forms of insanity present every phase of mental alienation, and are best treated with central galvanization. The monobromide of camphor in 4-grain capsules ter die (Clin's capsules) and arsenic. The application of the cautery to the nape of the neck occasionally is good practice. Also, Fothergill's solution of hydrobromic acid, 15 to 30 minims, after a warm bath, at bedtime, with cold to the head.

Insanity of Gestation or Pregnancy.—This is a rare disease. If a woman is predisposed to insanity, she may become so in her first pregnancy, but I think it rarely occurs without such predisposition. There may or may not be recovery at parturition, and the patient may pass into chronic insanity. The psychical state is generally that of melancholia.

* We have a case of this form of mental disease at present under our care in a girl of sixteen years, with marked excitability at each menstrual epoch and decided erotic tendencies. She will be very affectionate towards her mother, and then, with no provocation, strike her violently. She also is very profane at times, although she has been brought up in the most careful manner. We anticipate a speedy cure. At the time of writing this we have just been consulted relative to another case of a girl fifteen years of age, with pubescent insanity. Overstudy and grief at the loss of a brother, together with the excitement attendant upon the critical period, induced the attack.

Puerperal Insanity.—This form of mental disease occurs after parturition, generally, we think, owing to the absorption into the system of some of the retained products of conception, and therefore, on this principle, we have been accustomed to administer promptly a strong mercurial cathartic, 20 grains of calomel, followed by salines and mineral acids, and a course of hot baths, with cold to the head, and perfect rest and quiet. Acute mania and melancholia are the most frequent types of this insanity. The lochia are diminished or suppressed, and the milk sometimes. Among the exciting causes, Bucknill and Tuke rank mental shock of any kind, distress of mind, especially in unmarried women, a tedious exhausting labor, flooding and the use of the lancet for puerperal convulsions. Hereditary predisposition is of course, in many cases, a prominent feature. The prognosis is very favorable unless it assumes an inflammatory or typhoid type. I should confidently expect, under proper treatment, to see at least two-thirds of such patients recover in six months or in less time.

Insanity of Lactation.—The symptoms are of an asthenic type, and the patients are markedly anæmic. Full feeding, stimulants and ferruginous tonics are indicated. Melancholia is the most frequent psychical symptom. It is a disease of anæmia and exhaustion. The prognosis is good. The great majority of cases became insane after the fifth month of nursing.

Climacteric Insanity.—At least 6 per cent. of neurotic women at this period of life become insane. From 44 to 48 years of age is the age specially liable to these attacks. The cause of this type of insanity is a pathological condition of the uterus and ovaries. The record of 159 cases admitted into the West Riding Asylum, taken from the *West Riding Med. Reports*, vol. vi., for 1876, shows that the principal psychical symptoms in all these cases were delusions of fear and persecution, with depression. There were found cases of simple depression without hallucinations and with the intellect intact, but in some instances with great nervous irritability and general hyperæsthesia.

Another class of cases presented depression combined with affections of the emotions and the intellect, hallucinations of sight and hearing, and delusions of a depressing character being present.

Another class of cases presented delusions of fear, suspicion and persecution, as the most typical symptoms, with hallucinations of sight and hearing and maniacal excitement. A case now under our treatment is connected with the cessation of the catamenia. The

lady is 47 years of age. It is the first attack, and no hereditary history of insanity can be discovered. The disease or mental derangement commenced with simple depression, sluggish bowels, furred tongue, loss of appetite and of sleep, and hallucinations of hearing. She told me that she heard people in the house talking about her constantly, accusing her of appropriating things that did not belong to her, etc. She also imparted to me very confidentially in a whisper, that there had been secreted in a lounge in the room she occupied a fuse, which was connected with some explosives, and that the gentleman who owned the house was about to cause a great explosion, which would kill every one in the house. She would walk out, wring her hands and cry bitterly, lest herself and husband should become the victims of this "conspiracy," as she termed it. I suggested the advisability of a change of residence, to which she promptly acceded, and the treatment was commenced by a mercurial cathartic followed by salines. Vaginal examination revealed displacement of the uterus with engorgement and inflammation. The nurse was directed to use the hot vaginal douch of two gallons daily, and a pledget of absorbent cotton steeped in glycerine was inserted daily and left for four hours in contact with the uterus. The displacement was remedied, and the left ovary, which was enlarged and tender, thoroughly blistered. Continued warm baths of a temperature of 100°, with cold to the head, were ordered and continued daily for three weeks. A tonic of iron and quinine was ordered ter die before meals. Static electricity was employed, the patient being placed on the insulated platform and sparks taken from the spine, which was tender and irritable. This patient has now been under treatment for six and a half weeks. Her delusions and hallucinations have entirely disappeared; she eats well, sleeps well, with her night mixture of chloral hydrate 15 grains and fluid extract hyoscyamus gtts. x., and is cheerful and happy and constantly busy. I think she will make an excellent recovery, and if so will probably have no relapse.

Insanity from Abdominal Disorders.—These cases, which are usually referable to morbid states of the colon and liver, are characterized by melancholia and general wretchedness. They are very apt to be, we think, cases who inherit a tendency to insanity. This condition is very well illustrated by the following case, about which we were recently consulted: A gentleman of perhaps 60 years, by occupation a teacher, and a very close student, has been for years

gradually lapsing into insanity. There has been chronic constipation for years, due probably to defective action of the muscular coats of the colon, a condition which Professor Samuel G. Armor, of Brooklyn, ably explained in an article on "Morbid States of the Colon," published a few years ago. The patient's father committed suicide years ago. For some time—two or three years—the gentleman referred to has been rendered most miserable by the idea that he was a very wicked man; that he had committed unpardonable sins, and should be eternally lost. His life has always been exceptionally correct. He now has no ability to apply his mind, and these self-tormenting accusations never leave him, and he meditates suicide to escape from his misery. We advised opening the bowels thoroughly with seven grains of calomel, followed by salines, to be followed by a pill of aloes 2 grains and ox-gall 4 grains ter die, until he was thoroughly purged and all excrementitious matter removed. To act on the liver, a course of dilute nitro-muriatic acid, ♏xv. ter die, to be given, and a continued course of warm baths, with gradually increasing doses of opium, commencing with 20 minims of dialyzed opium, which is of the same strength as laudanum, ter die, and increase it to that point where the gloom of melancholia should yield to cheerfulness. He has started for the mountains to pursue this treatment, and will doubtless improve very much, but the fact of the strong direct inheritance makes perfect recovery problematical.

Post-Febrile Insanity.—Bucknill and Tuke, Nasse, Sydenham, Pinel, Baillarger, Aubanel, Thore, Falret, Sauret, Griesinger, and Hanfield Jones all report cases of this type of insanity. These cases are asthenic in type, and require quinine, arsenic, the mineral acids, and stimulants, with a generous diet.

Insanity may be the result of rheumatism and cardiac disease. There may be melancholia, mania, or chorea-like attacks. The urine may be loaded with lithates. The choreic movements, paralysis of motor power, hallucination of the senses, poor memory, delirium, with high temperature, the symptoms all decreasing as the temperature subsides, point to a poisoning of the cerebral centres by a vitiated blood plasma. Specific treatment by alkaline and salicylic acid for the rheumatism, the carbonate or citrate of lithia and the free use of Poland water, with tonics, should give good results. The insanity of cardiac disease is associated with endocarditis or pericarditis, and is only temporary generally. The psychical symp-

toms are those of a taciturn melancholy and hallucination. It is, according to Dr. Burman, a hypochondriacal melancholia, or a monomania of suspicion, and the patients are sullen, morose, or impulsive.

Insanity has been found to be associated with gout in some instances, the prevailing type being melancholia. Dr. Savage and Dr. Bertheir report cases, the latter saying that sometimes the gouty symptoms disappear and become lost in the insanity, which then passes into the choreic and incurable stage of dementia. He also says that it shows a preference for the form of general mania. Bucknill and Tuke say that cases are frequently met with in society which are marked by symptoms of unfounded dread, especially on awaking from sleep in the early morning, in which there is a gouty diathesis, and suspicion is aroused that there is a causal connection between the bodily condition and the mental anguish. This suspicion is confirmed by the marked success of treatment founded upon this supposition.

Phthisical Insanity.—There is a very close relation existing between phthisis and insanity. So often have I seen this that I invariably inquire if there is consumption in the family, and I think that in almost half my cases I have found this disease existing, *instead of a neurosis*, in a family strongly tainted with insanity. I have also known of a tendency to phthisis disappearing upon marriage and the family neurosis taking its place in at least two instances. I think that insanity, associated with phthisis, is most apt to be associated with melancholia, with a tendency to dementia. At least, such has been my own experience. Dr. Clouston thinks that the maniacal cases are the most apt to end in dementia and the melancholic cases to remain stationary, and his experience doubtless includes many more cases than my own, and I therefore regard it as more valuable, as his researches in this direction have been very valuable to the profession and have been watched by myself with great interest. He speaks of the acute stage of mania or melancholia as being of short duration and succeeded by an irritable, excitable, sullen, and suspicious state. There is a want of fixity, he says, in their mental condition, unaccountable little attacks of excitement, lasting only a short time, unprovoked paroxysms of irritability and passion in a subdued form. There is a disinclination to enter into any kind of amusement or continuous work, and if this is overcome, there is no interest manifested in the employment. It might be

called, he says, a mixture of subacute mania and dementia. The depression is general, and there is no fixed delusion. If there is any single tendency that characterizes these cases, *it is to be suspicious.*

From my own experience, I think Dr. Clouston's excellent description of the mental symptoms of insanity associated with phthisis, is perfectly diagnostic, and the profession owes him thanks for his laborious researches in this field. Twenty-five per cent. of Dr. Clouston's cases exhibited a suicidal tendency. The prognosis is bad. Cod-liver oil and full feeding, with mountain air or any climate where the patient can live most of the time out of doors, with port wine at meals, offer the best chance of cure in the early stages, together with the phosphates. I generally use the liquor acid. phosphorici comp., Dr. William Pepper's formula, and I give morphia to those suicidally inclined.

Syphilitic Insanity.—This comparatively rare form of mental disease presents itself, according to Drs. Bucknill and Tuke, under two forms: congenital weakness of mind and acquired insanity. The most frequent symptoms are those of progressive dementia, with considerable loss of memory, but without expansive ideas, preceded by a period of hypochondriacal melancholy. During the early form of it we may meet with all the known forms of mental disease, but rarely acute mania. In addition to the pains in the head, there may be affection of the motor or sensory centres, the former presenting many symptoms in common with general paralysis. This insanity may come on immediately after infection, according to the same authority, or be preceded by cerebral attacks, either of an epileptic or apoplectic nature, dementia gradually and insidiously supervening. Wille gives three forms: 1st. The irritative simple form, generally due to an anæmic state. 2d. A state marked by general mental disorder, due to meningitis and softening; and 3d. A state characterized by psychical disturbance, due to circumscribed inflammatory softening, atheroma of the vessels, and gummous neoplasm of the brain and membranes.

Dr. Mickle gives the following symptoms as occurring in his cases: Convulsive symptoms of various kinds, dementia and hemiplegia, apoplectic symptoms or coma, drowsiness, somnolence, especially in the latter periods, with a great variety of mental symptoms occurring during the earlier periods. Headache, aphasia, difficult articulation, and paralysis of cranial nerves are often found, and vomiting, blind-

ness and optic neuritis are not infrequent. The principal features are: 1st. A marked tendency toward mental deterioration, the predominance of negative intellectual symptoms, associated with weakness or loss of the moral sense and a general inclination to a degraded state of feeling. In some cases early or intercurrent outbreaks of maniacal symptoms appear; in a few cases there is causeless depression, fear, or emotional weakness. 2d. Motor symptoms, of the paralytic or convulsive type. 3d. Sensory symptoms; great nocturnal pain, especially in the head; anæsthesia occurs rarely, and sometimes impairment of sight, blindness, or unilateral deafness at times, and very seldom hallucinations. If, after death, no intracranial syphilitic lesions are found, we cannot with accuracy attribute the origin of the insanity to syphilis, even though the patient may have contracted the disease and his insanity has occurred weeks or months subsequent to such infection.

The differential diagnosis between syphilitic insanity and paralytic dementia is, that in the former, hypochondriacal feelings and ideas are more often noticed at the very first, yielding gradually to dementia. In the former, prior to severe apoplectiform and other attacks, the loss of memory, confusion of thought, and tendency to fatuity are less marked, advanced, and fixed than in paralytic dementia, there is more an obscuration than a destruction of mind. Paroxysmal outbreaks of excitement are rather more frequent in the syphilitic cases, and also such symptoms as convulsions, spasms, paralyses, and sensorial disorders. Insomnia and mental irritability are more marked in the syphilitic patient, but to this there are exceptions on both sides. When delusions of grandeur are present, cases of syphilitic insanity are to be diagnosed from general paralysis from the history and symptoms of syphilis; the preceding cranial pains, nocturnal and intense; the exaltation is less marked; paralysis of one or several cranial nerves, or hemiplegia, paraplegia, etc., having the character of syphilitic paralysis; the greater frequency of optic neuritis, early amaurosis, deafness, local anæsthesia, vertigo or local rigid contraction; speech not accompanied by marked facial or labial tremors; by cerebral or spinal meningitis; the variety of the motor and sensory symptoms; and finally, by the effect of antisyphilitic treatment.

Dr. Clifford Allbutt, Dr. Erlenmeyer, Dr. Hughlings Jackson, Dr. Wilks, Dr. Batty Tuke, Dr. Buzzard, Dr. Clouston, and Dr. Dowse have all written ably on this form of insanity. Drs. Bucknill and Tuke say that the first point in treatment is to determine whether

the syphilitic condition present is secondary or tertiary. If secondary, as indicated by the presence of affections of the skin and the mucous membranes, or by iritis, or pains in the muscles, joints, and bones; by periostitis and nodes,—a condition in which the venereal poison still exists and may be transmitted,—then mercury is beneficial, and iodine is of little or no service. If the pathological conditions present are those which indicate tertiary syphilis, in which the venereal poison no longer exists in a form which can be transmitted to others; a state of cachexia, which is indicated by inflammations of the fibrous membranes; by caries and necrosis of bone; by rupia and sloughing ulcers of the skin and other soft parts; by deposits of imperfectly-organized fibro-plastic lymph in the areolar tissue of various parts and organs; in such cases the remedies required are iodine and sarsaparilla, and mercury is dangerous. Mr. Lane says, respecting treatment, that the iodide of potassium should be given in from three- to ten-grain doses in a third of a pint of the simple or compound decoction of sarsaparilla as a vehicle, alternating with a pill of two grains of quinine and three grains of confection of opium, also taken thrice daily. Exceptional cases may require the iodide to be increased to fifteen or twenty grains, and an additional dose of opium at night will often be found necessary. Opium allays pain and irritability, and moderates all excessive secretion, preventing unnecessary waste.

Alcoholic Insanity.—This insanity is very different from dipsomania, which is characterized by the irresistible craving for and periodical indulgence in drink to the point of complete intoxication. Alcoholic insanity may be characterized by mania, melancholia, or chronic mania lapsing into dementia. Hallucination of sight and hearing, taste and smell may all be present. The patient may have no memory, no appreciation of his condition or surroundings, and his speech and gait may be strongly suggestive of a general paralytic. He may have delusions as to place, and insist he is at some quite different locality from the one he occupies. He may pass his time in a stupid delirium or he may be quite furiously maniacal. There may be fatty degeneration and atheroma in the nerve-centres, or there may be diffuse interstitial sclerosis. The treatment should consist of broths, easily digested food, with quinine and strychnia for nerve tonics. These two remedies in combination have seemed to me in connection with the liquor acidi phosphoric. comp. and the oxide of zinc, in 2-grain doses, to be better adapted to antagonize

the morbid condition present and to lead to a recovery than any other plan of treatment.

Kleptomania and Pyromania have been recognized by Maré, Crichton Browne, Dr. Savage, Dr. Steinau, Tilt, Dr. Burman, Jessen and Ray as states of undoubted insanity. Bucknill and Tuke would prefer to include pyromania under the head of destructive insanity. That these acts may arise out of a purely diseased mental condition there is abundant proof in the writings of the authors referred to. We should look in these cases, say Drs. Bucknill and Tuke, for hereditary predisposition to insanity; evidence of mental derangement prior to the development of the propensity; the earliest symptoms of general paralysis; the occurrence of any physical disorder, as brain fever; the suppression of any discharge, or an injury to the head, puberty, pregnancy, the absence (in most cases) of any inducement to steal; the general conduct of the individual during and after the act, and especially (although cunning and concealment are consistent with this form of mental disorder) voluntary restitution of stolen goods. Maré says, respecting pyromania, that incendiary acts are chiefly manifested in young persons, in consequence of the abnormal development of the sexual functions, corresponding with the period of life between twelve and twenty. We should, therefore, in these cases inquire as to whether there exist any general symptoms indicative of irregular development, or of critical changes in the evolution of the reproductive system, whether signs were present before the incendiary act of approaching menstruation, its derangement or suppression, whether in epilepsy or catalepsy or an irregular pulse, vertigo, headache, etc. Very often there is a change in the character, such as a tendency to sadness, insensibility, and other symptoms of disordered cerebral functions. Maré relates the case of a boy who struggled for a year against such an impulse, finally setting fire to his father's house. Ray writes of a girl who heard voices commanding her to burn; also of another girl who had an apparition constantly before her impelling her to pyromania.

CHAPTER XIII.

INSANITY IN THE MIDDLE STATES.

INSANITY is in the Middle States, as in the other States, increasing disproportionately to the increase of population, and it also seems to be appearing at an earlier age than formerly, which latter fact is probably due to hereditary influences which have gradually become intensified by violation of physical laws in early life, want of proper training, and too high pressure in education. This feverish haste and unrest which characterize us as a people, the undue predominance of the nervous temperament, and the want of proper recreation and sleep, tend to a rapid decay of the nervous system and to insanity as a necessary sequence. It is much to be deplored that intemperance is operating more and more each succeeding year as a formidable cause in the production of insanity. At least twenty-five per cent. of all cases of insanity admitted into the asylums of our Middle States is due either proximately or remotely to intemperance, which has produced a permanently diseased state of the brain, due to the interference in the nutrition, growth and renovation of the brain-tissue. The evil does not stop here; for the offspring of intemperate parents are growing up in our midst with weakened if not actually diseased nervous systems, and will inevitably in time become insane, diseased or idiots.

The census returns for 1870 of the United States showed an increase of insanity of 55 per cent., while the increase of the general population had been 22 per cent. The proportion of insane to sane population has increased from 1860, when it was shown that the entire population of the United States was 31,443,231, with an insane population of 23,999, or one insane person in every 1310 of the whole population; up to 1875 inclusive, when, by bringing up the calculation at the same rate of increase for both sane and insane population as obtained between 1860 and 1870, we find the former to be 42,115,896, and the latter or insane population 44,148, or one insane person to every 953 of the whole population of the United States.

It may not be uninteresting to glance for a moment at the proportion of insane to sane population in other countries as compared with our own. In England there is one insane person to every 403 of the

whole population, or more than double the proportionate number of the United States. In France there is an average of about one insane person to every 600 of the whole population. In Scotland there is one insane person to every 336 of the sane population, while in Ireland there is one insane person in every 302 of the population.

In the United States, California has heretofore exhibited the greatest proportion of insane to sane population, there being one in every 484. This is due to local causes. Massachusetts has shewed the next greatest proportionate number of insane, while the New England States, as a whole, have a greater relative increase in the proportion of the insane to the sane population than has been observable in either the Middle, Southern, or Western States. In the care in the treatment, in finely appointed institutions, and in scientific investigations into the causes of insanity, the Middle States hold a place of which they may be very justly proud.

The forthcoming national census is about to reveal that the present number of the insane, within the United States, is nearly twice as large as has generally been supposed. In the State of Massachusetts, for example, where thirty years ago there was one insane in every thousand, there are now nearly three to every thousand, and other States show the same proportion.

New York.—The New York State asylums or hospitals for the acute insane, in the order of their organization, are: The State Lunatic Asylum at Utica; the Hudson River State Hospital for the Insane at Poughkeepsie; the State Homœopathic Asylum for the Insane at Middletown; and the Buffalo State Asylum for the Insane at Buffalo.

The Utica Asylum had 626 patients in its care October 1st, 1881, and it received 412 during the year ending September 30th, 1882. This gave a total of 1038 patients under treatment during the year, the daily average being 621. There were discharged, recovered, 109; improved, 46; unimproved, 235; as not insane, 13; died, 57. Remaining September 30th, 1882, men, 291; women, 287; total, 578.

The Hudson River State Hospital at Poughkeepsie is only partially completed, and has accommodations for 300 patients. The whole number under treatment during the year ending September 30th, 1881, was men, 220; women, 210; total, 430. The highest number in the asylum at any one time was 280, and the average was 256. Of those under treatment during the year 22 recovered, 28 were

discharged improved, and 80 unimproved, 1 as not insane, and 26 died. Average weekly cost of support, $5.87 per patient.

The State Homœopathic Asylum for the Insane at Middletown.—This institution is now practically completed, and it receives the acute insane whose friends desire their treatment in accordance with homœopathic principles, from all parts of the State. It has accommodations for 400 patients. 340 patients were treated here during the year ending September 30th, 1881, the average number under care being 213. There were discharged, recovered, 61; improved, 18; unimproved, 30; died, 15. The average weekly cost the past year was $4.67.

The Buffalo State Asylum for the Insane is only partly completed, the centre and one wing being as yet erected. It was opened in January, 1881, and the number of patients admitted from that date to September 30th was men, 122; women, 97; total, 219. There were discharged, recovered, 19; improved, 11; unimproved, 10; as not insane, 1; died, 22; leaving 156 under treatment September 30th, 1881.

The total capacity at present of the several New York State hospitals for the acute insane is for 1600 patients. When, according to the plans adopted, the Hudson River State Hospital and Buffalo State Asylum are completed, 2200 acute insane can be cared for. The counties of New York, Kings and Monroe, embracing a population of 1,951,028, provide for their acute as well as their chronic insane in local institutions, presently to be described, under special statutes. This leaves the State to provide only for the acute insane arising in the other counties, having a population of 3,133,954.

The New York State Asylums for the Chronic Insane are, the Willard Asylum for the insane at Ovid, and the Binghamton State Asylum for the chronic insane at Binghamton. These institutions are designed for the chronic pauper insane, transferred from the county poor-houses or the various State hospitals for the acute insane as not cured. The State is districted between the two institutions. The charge to the counties for maintenance and care is restricted to the actual expense.

The Willard Asylum has accommodations for 1800 patients. There were 1735 patients here September 30th, 1881, of whom 814 were men and 921 women. Average number under care 1695, and average weekly cost $2.67.

The Binghamton Asylum for the chronic insane was formerly

the State Inebriate Asylum, converted to the care of the chronic insane in 1880. It was opened for patients October 20th, 1881. There were 66 patients here December 31st, 1881. This institution can accommodate 325 patients.

The New York State asylums for the chronic insane can, therefore, accommodate 2100 patients.

Respecting the care of idiots, there are the New York Asylum for Idiots at Syracuse, and the custodial branch at Newark. The Syracuse institution had 292 inmates October 1st, 1880, while at Newark, Wayne County, there were 98 inmates October 1st, 1880.

The number of the insane in the various State institutions October 1st, 1881, was 10,057, as against 9537 October 1st, 1880, and 9015 October 1st, 1879; of these 4458 were males and 5599 females. With a population according to the last Federal census of 5,082,982, the proportion of insane of this State October 1st, 1881, was 1 to every 505 inhabitants.

Kings County provides for her insane in the Kings County Lunatic Asylum at Flatbush, and has about 1000 or 1300 patients. The total annual cost is about $92,400. The New York County asylums are the New York City Asylum for the insane, and the New York Lunatic Asylum on Blackwell's Island. The total annual cost for the New York City Asylum for the insane on Ward's Island is $53,504, and on Blackwell's Island $89,420.

The State Asylum for insane criminals at Auburn, New York, was erected in 1859, at a cost of $125,000, and has 842 acres of land attached to it. The cost of subsequent additions has been $52,000, making the total cost of the present building $177,000. The annual expense per patient is $208. The State appropriates $16,000 annually for this institution. The total annual cost is $24,544. On Ward's Island is also situated the State Emigrant Insane Asylum, which provides for the insane emigrants for the term of five years from the time of their landing in this country. This asylum furnishes accommodations for 200 patients. The annual expense per patient is $150, and the total annual cost $22,500.

New Jersey.—The New Jersey State Lunatic Asylum, at Trenton, New Jersey, was erected in 1848, and has attached to it 170 acres of land. It has a capacity of 500 patients. The original cost of the building was $100,000, and the cost of subsequent additions has been $178,000, making a total cost of $278,000. The per capita cost of building is estimated to be $556. The State appropriates, annually,

$8000 for the asylum. Five-sixths of the patients are paupers, at $4.50 per week, paid by counties. Among the patients in this asylum are included the convict insane, who have been transferred to the institution from the State prison by virtue of the twelfth section of the Act of the Government and Regulation of the State Prison, approved March 26th, 1869.

The new asylum is situated at Morristown, New Jersey, and has been erected at a projected cost of $2,250,000, and is one of the finest large institutions in this country, if not in the world. The site is admirably selected, and covers about 400 acres of land, which cost about $80,000. The asylum has a capacity of 800 patients. The per capita cost of building is estimated at $2802. The water-works cost $20,000, and the water supply is said to be four times enough to meet the ordinary wants of the institution. The building has a frontage of 1250 feet, and it is a mile and a quarter around it, outside of the foundation line. It is a four-story, semi-Gothic structure, built of syenitic granite, quarried on the grounds. All the main materials for the building were also obtained on the grounds—the stone, the clay for brick, etc. Brick was made at the rate of 80,000 per day, about 15,000,000 having been used in the construction.

Pennsylvania.—Pennsylvania has five State hospitals,—Dixmont, Norristown, Harrisburg, Warren, Danville—for the insane, each of which provides accommodations for 500 patients, and another is to be erected in Philadelphia. There is also a Friends' hospital, at Frankford, Pennsylvania. The city of Philadelphia is entitled to the credit of making the first regular provision for the insane ever made in America. In 1751 the Pennsylvania Hospital, at Philadelphia, was incorporated by the Provincial Assembly, for the purpose of providing for the indigent sick and for the *care and cure* of the insane. The first patient placed for treatment of insanity was admitted to that hospital February 11th, 1752.

The second institution was the asylum at Williamsburg, Virginia, opened 1773. At the present day we have in operation in the United States, I think, seventy-six hospitals for the insane, which will accommodate 29,000 patients. Since the establishment, in 1751, of the Pennsylvania hospital, with its sound declaration of principles, which, even at that time, recognized insanity as a physical disease capable of cure, up to 1805, when Dr. Benjamin Rush delivered lectures on insanity, with clinical instruction in his wards, and down to the present time, when the hospital is presided over by the able

specialist in mental disorders, Dr. Thomas S. Kirkbride, and when the State laments the loss of the late eminent alienist, Dr. Ray, Pennsylvania has maintained a position in the application of State medicine to the treatment of insanity of which she may be justly proud. A separate institution is much needed in this State, for the criminal insane. It is estimated that in June, 1883, there will be 6093 insane persons living under the present system of treatment.

The insane in *Delaware* are scattered all over the State in almshouses, jails, etc., and many of them are provided for in the Pennsylvania hospital.

In this connection it is both appropriate and proper to say a word in remembrance of the late Dr. I. Ray, of Philadelphia, by whose knowledge and experience so many of us have profited. He was born at Beverly, Massachusetts, January 16th, 1807. Graduated at Harvard Medical School in 1827. In 1841 he was appointed superintendent of the Augusta, Maine, State Hospital for the Insane, remaining there until 1846, when he assumed charge of the Butler Hospital, at Providence, Rhode Island, where he remained until 1867, when, by reason of failing health, he resigned and moved to Philadelphia. He did a great deal for the medical profession by his able, scientific, and learned writings, and was an expert of vast knowledge and ripe experience in mental medicine. He was one of the pioneers in psychological medicine in this country, and it is owing to him that much advance has been made in the right direction. His works are written in beautiful English, and will take their place as classical treatises on psychological medicine. He died March 31st, 1881.

CHAPTER XIV.

PROVISION FOR THE CHRONIC INSANE.

From a thorough and extended examination of the reports of our insane asylums—and these remarks cover not only the Middle States, but apply equally as well to all of the States—it seems to be very evident that we are building large, expensive institutions, fitted up with all the appurtenances demanded by modern science for the

treatment and cure of insanity, and that, as soon as such institutions are opened for the reception of patients, they become filled up with a class of cases three-fourths of whom are chronic and hopelessly insane patients. It is no less evident that if proper provision is not made for this class of the insane each State must build, every few years, a very expensive institution, for which every city and town must be heavily taxed. What are we going to do to relieve this rapidly increasing difficulty? If this class of the chronic insane are well taken care of they are going to live in this hopelessly insane state—from which, at the utmost, not more than 10 per cent. will ever recover—for years, costing for their maintenance not less than $3.50 per week. It is a fact that every medical superintendent of an institution for the insane must have noticed, that the presence of this incurable class of patients exercises a very depressing and unfavorable effect upon the minds of the recent and acute cases. If a patient perceives upon admission that the population is made up principally of patients who have been inmates for years and for whom no hope of cure is entertained by the medical officers, and that few patients go out restored to health, the moral effect must necessarily be depressing and disastrous upon the mind of such a patient and tend to retard his own recovery. At present many large, fine institutions, instead of being, as they were originally intended to be, *hospitals* for the *treatment* and *cure* of the insane, are merely *asylums* and *receptacles* for the *retention* of patients at an enormous expenditure of money for architectural display. The overcrowding of such institutions by the retention of the chronic insane precludes the possibility of proper classification or proper ventilation. By transferring this class of the chronic insane and leaving the class of recent and curable insane, we derive many advantages. First and most important, the patients understand that they are in a *hospital*, that they come to be cured of a physical disease, and that, by submitting to the treatment and discipline of the institution, they *will* be cured. Secondly, the superintendents will have at their disposal ample room for proper classification, good ventilation, amusements, and recreation. The present system of asylum management is defective and expensive beyond the ability of the State to meet the demand, and tends directly to increase the number of the chronic insane, as 90 per cent. of the capacity of all of our State institutions is now occupied by the chronic insane to the exclusion of recent and curable cases. This class of cases often become chronic and incurable cases in many of our

States before they can obtain the proper curative hospital treatment, which, if applied in time, would have resulted in a speedy cure and restoration to their families, and a saving of their productive power to the commonwealth. From an extended examination of the statistics of the State insane asylums in the United States in 1875, I found that the total cost of 55 of these institutions was not far from $29,879,258. This made an average cost for each of these institutions of $543,259, and an average per capita cost of $1074 for each of the asylums in our country. Now I maintain that no State can afford to provide for the chronic insane at such a per capita cost of hospital construction when they can be provided for at a per capita cost of construction of $300 by providing for them plain, substantial buildings. It would be very easy and practicable to erect such buildings, accommodating 50 patients, for $15,000 each, while no building accommodating the number that four such cottages or buildings would provide for could be built for less than $200,000.

For the chronic and harmless insane, we do not need so many attendants or such costly accommodations as for acute and recent cases. For the chronic insane we need plain but substantial buildings, which should, I think, be located on a large farm, so that the patients could be employed out-of-doors. In this way these patients could be made producers, and could be supported at comparatively little cost to the State, and at the same time they would have the benefits accruing from a good, plain, country style of living, with an abundance of fresh air, sunlight and regular and systematic occupation. By such a course of treatment many would improve in general health, and some would probably recover who would never have been benefited if they had been confined in an asylum. Of the thousand patients admitted to the asylum for the chronic insane at Tewksbury, Mass., during the eight years of its existence, about one hundred have recovered or improved by outdoor work, and the experiment is regarded as a decided success. The expense has averaged, I think, not far from $100 a year for each inmate, and it is stated by competent authority, that the patients are as well cared for as they were previous to their admission. The establishment in 1869, of the Butler Asylum for the chronic insane in Rhode Island, was found to be a very successful experiment. It is a well-managed institution, and the trustees say regarding it, that "its result is to enlarge the capacity of the hospital for the treatment of recent cases of insanity, and thereby to increase its beneficial

agency as a curative institution." Quite a number of patients have recovered through the agency of the outdoor work, and it is stated that the patients are better cared for than before coming to this institution. The annual saving to the State of Rhode Island is stated to be over $12,000, while the amount saved annually to the State of Massachusetts by the establishment of the Tewksbury Asylum, is stated to be $25,000.

The Willard Asylum for the chronic insane at Ovid, New York, regarded by many as an experiment of doubtful expediency, has proved, under the skilful management of its able medical superintendent, Dr. John B. Chapin, to be a highly successful measure. The trustees say, " The idea heretofore promulgated that the chronic insane could not be so well cared for in a separate asylum, and that it was better to retain them in a hospital with recent and acute cases, has proved on trial here to be a fallacy."

To deal with the steadily increasing mass of lunacy is a problem which, as time goes on, becomes, by its magnitude, more and more difficult of solution. There can be no doubt that the only way of checking the growth of lunacy, is by treating, in properly organized hospitals, the recent cases as they occur, and that cannot be effectively done until our present asylums are eased of some of the dead weight of chronic insanity which fills their wards and hampers their curative powers. The great objection which has been urged by those opposed to the separation of the recent and chronic insane, has been that the latter, in institutions designed for them alone, would be neglected and abused, and they would not receive proper medical attention and care. The results thus far have not confirmed these fears. Under all circumstances such an institution should be presided over by a medical superintendent of equal ability and capacity to those at the head of hospitals for the recent insane, and no attempt should be made to put such patients on a poor, meagre or insufficient diet, and they never should be neglected or abused. By having these asylums located on large farms, we secure to the patients, as I have previously remarked, occupation, fresh air and sunlight, and a good nourishing country style of living, and if there are any possibilities of recovery in any of the patients, such a plan of treatment will develop them.

CHAPTER XV.

LUNACY IN ENGLAND.

In the year 1860 the total registered number of the insane in England and Wales was 38,058; in 1870, 54,713; and in 1880, 71,191. Insanity, however, has not doubled, but there has been an increasing readiness to place persons as lunatics in establishments. In England 43 per cent. of the private patients are in private asylums. There are sixty county and borough asylums in England, containing 40,000 beds. The average cost per bed has been not quite £200. The weekly cost of each patient is 10 s., and the yearly cost £40. They are governed by a committee of the Justices of the Peace, under the control of the Secretary of State for the Home Department.

Two of the best of the English county asylums, are that for Sussex at Hayward's Heath, and that for Surrey at Brookwood. The State Asylum for the criminal insane is located at Broadmoor. The four great metropolitan asylums, which hold 6600 lunatics, are situated at Hanwell, Colony Hatch, Banstead and Wandsworth. There are also in England fifteen insane hospitals, including the idiot asylums at Earlswood and Lancaster, where the insane of the upper and middle classes are treated.

Lunacy in Scotland.—In 1858 the Commissioners in Lunacy for Scotland entered upon their duties, at which time the insane registered population amounted to 5823 persons. On January 1st, 1881, there were under treatment a total number of 10,012 patients. There have been several important improvements introduced in Scotland, in the mode of treating patients; the abolition of walled airing courts; the disuse of locked doors; and the extension of the practice of giving liberty on parole.

In the Fife and Kinross Asylum, containing 330 inmates, only two wards, one for 20 female patients and one for 30 male patients, are kept locked.

In the Barony Asylum at Lenzie, which contains 500 patients, there is free communication between all the wards, as well as free egress from each of them to the general grounds of the asylum.

The Commissioners of Lunacy are united in their commendation of

the arrangements existing in the private asylums of Scotland, and in no single instance has any complaint been made, either against the administration or the building.

The following are the revised orders respecting the case-books in English asylums :

"The Commissioners in Lunacy, by virtue of the power vested in them by the act of Parliament, passed in the session holden in the 8th and 9th years of the reign of her present Majesty, entitled 'An Act for the Regulation of the Care and Treatment of Lunatics,' do hereby order and direct—

"That the medical 'case-book,' by the said act directed to be kept in every licensed house and hospital, shall be kept in the form hereinafter mentioned, viz.:

"First. A statement to be entered of the name, age, sex and previous occupation of the patient, and whether married, single or widowed.

"Secondly. An accurate description to be given of the external appearance of the patient upon admission; of the habits of body, and temperament, appearance of eyes, expression of countenance, and any peculiarity in form of head, physical state of the vascular and respiratory organs, and of the abdominal viscera and their respective functions, state of pulse, tongue, skin, etc., and the presence or absence, on admission, of bruises or other injuries to be noted.

"Thirdly. A description to be given of the phenomena of mental disorder, the manner and period of the attack, with a minute account of the symptoms, and the changes produced in the patient's temper or disposition; specifying whether the malady displays itself by any, and what, illusions or irrational conduct, or morbid or dangerous habits or propensities; whether it has occasioned any failure of memory or understanding, or is connected with epilepsy, or ordinary paralysis, or symptoms of general paralysis, such as tremulous movements of the tongue, defect of articulation, or weakness, or unsteadiness of the gait.

"Fourthly. Every particular to be entered which can be obtained respecting the previous history of the patient; what are believed to have been the predisposing and exciting causes of the attack; what the previous habits, active or sedentary, temperate or otherwise; whether the patient has experienced any former attacks, and if so at what periods; whether any relative has been subject to insanity; and whether the present attack has been preceded by any premoni-

tory symptoms, such as restlessness, unusual elevation or depression of spirits, or any remarkable deviation from ordinary habits and conduct; and whether the patient has undergone any, and what previous treatment, or has been subject to personal restraint.

"Fifthly. During the first month after admission, entries to be made at least once in every week, and oftener where the nature of the case requires it. Afterwards, in recent or curable cases, entries to be made at least once in every month; and in chronic cases, subject to little variations, once in every three months.

"In all cases an accurate record to be kept of the medicines administered and other remedies employed, with the results, and also of all injuries and accidents. That the several particulars hereinbefore required to be recorded be set forth in a manner so clear and distinct as to admit of being easily referred to and extracted whenever the commissioners shall so require."—*Office of Commissioners in Lunacy*, 19 *Whitehall Place*.

The work of freeing the insane from mechanical restraint is due primarily to Dr. John Conolly. Dr. Paget, in his Harveian oration, in England, in 1866, thus speaks of it: "In June, 1839, Dr. Conolly was appointed resident physician at Hanwell. In September he had abolished all mechanical restraints. The experiment was a trying one, for this great asylum contained 800 patients. But the experiment was successful; and continued experience proved incontestably that in a well-ordered asylum even the strait-waistcoat might be entirely discarded. Dr. Conolly went further than this. He maintained that such restraints are in all cases positively injurious; that their use is utterly inconsistent with a good system of treatment; and that, on the contrary, the absence of all such restraints is naturally and necessarily associated with treatment such as that of lunatics ought to be,—one which substitutes mental for bodily control, and is governed in all its details by the purpose of preventing mental excitement, or of soothing it before it bursts out into violence. He urged this with feeling and persuasive eloquence, and gave in proof of it the results of his own experiment at Hanwell, for, from the time that all mechanical restraints were abolished, the occurrence of frantic behavior among the lunatics became less and less frequent.

"Thus did the experiments of Charlesworth and Conolly confirm the principles of treatment inaugurated by Daquin and Pinel, and prove that the best guide to the treatment of lunatics is to be found

in the dictates of an enlightened and refined benevolence. And so the progress of science, by way of experiment, has led men to rules of practice nearer and nearer to the teachings of Christianity. To my eyes, a pauper lunatic asylum, such as may now be seen in our English counties, with its pleasant grounds, its airy and cleanly wards, its many comforts, and wise and kindly superintendence, provided for those whose lot it is to have the double burden of poverty and mental derangement—I say this sight is to me the most blessed manifestation of true civilization that the world can present."

The English lunacy law, setting aside the special statutes dating from King Edward II., regulating the proceedings in chancery, are the result of the legislation of 1845, and consist chiefly of acts amending other acts. It is considered in England that a bill for the general consolidation and amendment of these several statutes is an urgent necessity. The government of Lord Beaconsfield announced in her majesty's speech from the throne, on the opening of Parliament in February, 1880, that such a measure was in preparation. It is earnestly desired in England that the government should give the question of lunacy law reform their early and careful attention. It has been suggested by Dr. C. Lockhart Robertson, Lord Chancellor's Visitor in Lunacy, that a royal commission should be issued to investigate and report on the working, in detail, of the lunacy law, and to make suggestions for its consolidation and amendment. What seems to be desired for one thing, is a cheap and speedy method of placing the property of lunatics under the guardianship of the Lord Chancellor. It seems to many in England desirable that, as in Scotland, the whole lunacy of the kingdom should be under the control and cognizance of the lunacy board. Dr. Robertson says: "The whole future efficiency of the English county asylums depends upon the right adjustment of the relative control given to the local authorities through the new county boards and to the central government through the commissioners in lunacy."

There seems to be an idea that the present lunacy commission of England requires both extension and remodelling, although great confidence is expressed in England in the ability, industry, and integrity with which the existing lunacy law is administered by the commissioners. The English Government needs to pass a wide and comprehensive measure of lunacy law reform, so as to extend to the insane of England the fullest amount both of protection and liberty.

The Royal Edinburgh Asylum at Morningside, is under the able management of Dr. Clouston. This institution has beds for two hundred private and six hundred pauper patients. These two classes are assigned to separate buildings. For the private class there are two or three cottages, and also Craig House, which accommodates twelve or fifteen of the best-paying patients. Those patients of the private class who do not pay much more than the institution receives for charity patients, live in the same buildings with the latter class, but have a separate dining-room and a better dietary than the pauper class. The main building is in excellent condition, and has fine dining-rooms, off from which run conservatories filled with plants and flowers. There are also glass corridors about the building for exercise in bad weather. There are open-grate fires in the wards. The patients are employed about the grounds. Dr. Clouston treats his excited patients by keeping them out all day in the open air, and gives a warm bath, followed by the bromides, at night. No mechanical restraint is used. There are padded rooms for violent cases, but Dr. Clouston believes in full liberty and little seclusion.

The three Middlesex asylums are Hanwell, Colney Hatch, and Banstead. Dr. Raynor is the medical superintendent of Hanwell, and his patients are mostly acute and recent cases. Nearly all of his patients are kept employed in some manner. He uses no mechanical restraint, but canvas suits are used for destructive patients. In cases of great excitement, he employs extra attendants. There are padded rooms for violent cases. Dr. Raynor uses few sedatives, but keeps his maniacal cases in open air.

At Colney Hatch, Dr. Marshall has the superintendence of the female department, and Dr. Shephard of the male side. No mechanical restraint is used, but they have strong rooms and also padded rooms. Sedatives are seldom used.

Dr. T. Claye Shaw is the medical superintendent of the Banstead Asylum, and he treats his patients on the non-restraint system. The patients are made to work whenever possible. They have mittens and padded rooms for bad and destructive cases.

In Bethlehem and St. Luke's Hospitals, the patients receive few sedatives, and are treated on the non-restraint system. They have padded rooms and canvas clothing for destructive patients. At Bethlehem there is one attendant for every six patients.

Dr. Richard Greene is the superintendent of the Northampton

County Insane Asylum at Berrywood near Northampton. The building accommodates 600 patients. There is one attendant for every 15 patients. Close shutters close all the windows in the single rooms, and the other windows have stops, which prevent their being either raised or lowered more than about half a foot. There are padded rooms and also rooms with double doors. The suicidal cases are placed in one ward every night, and are specially watched. The patients occupy single rooms with doors of open woodwork to make surveillance easy. The patients are all made to work, and all the shoes and clothes of the male patients are made in the shops by male patients. Sedatives and the wet pack are used as required.

The Manchester Royal Asylum at Cheedle is run on the extreme non-restraint system. There are no walls about the asylum as is customary in England. Both pay patients and charity patients are received. Many patients have their own private parlors besides their sleeping-rooms, which are one story higher up. In maniacal cases dark and padded rooms are used. Sedatives are used whenever needed. Nothing but mittens are used in the way of mechanical restraint.

Mr. Bailey is the superintendent of St. Andrew's Hospital at Northampton, and the patients come entirely from the upper and middle classes. There are many acres of ground, beautifully laid out in fine lawns and gardens, and the accommodations within are spacious and first-class in every respect. Mechanical restraint is unknown, attendants taking the place of restraint. Sedatives are freely used.

Dr. Yellowlees is the able superintendent of the Royal Glasgow Asylum at Gartnarel. The pay patients and charity patients are separated in different buildings. The private patients take their meals in the corridors, and the charity patients have a large common dining-room. The lowest price for patients is, I believe, two guineas per week, while charity patients are paid for by their parishes at twelve shillings per week. The asylum is run on the non-restraint system. Sedatives are freely used when necessary. Dr. Yellowlees secures the clothing on destructive patients by locked buttons and buckles. There are many open fire-places.

Dr. C. H. Skae is the superintendent of the Ayr District Asylum, which holds 300 patients of the lower classes.

Dr. Rutherford is the able superintendent of the Barony Parochial Asylum at Lenzie near Glasgow. The buildings will accommodate

500 patients. There is one attendant for every 12 patients. Open fire-places are in use, and all able-bodied patients work outside. The non-restraint system and unlocked doors are the rule. There are workshops for all the trades. They have a farm of four hundred acres, and there are no fences about the grounds. Very few sedatives are used here. Maniacal patients are kept in the open air; of course escapes are frequent. Some of the hospitals have summer houses, where small parties go out, stay for two or three days or weeks, and return again, fresh sets of patients being allowed to go out in the same manner. This is true of the Edinburgh Asylum, the Bethlehem Hospital, and the Asylum at Cheedle. In Scotland moleskin garments are used for destructive patients who tear their clothing. In 1881, 310 escapes were made from Scottish asylums; of these 206 were brought back within twenty-four hours, 61 in less than a week, and 21 after more than seven days. The remaining 22 did not return. Accidents during 1881 were 141; 11 ending fatally.*

With regard to the increase of lunacy in Scotland the commissioners say: "The figures in the table do not indicate any steady or appreciable increase in the admission of private patients into asylums, while there is a very considerable increase in the number of pauper lunatics registered during the last year. This increase exceeds that during any year since the establishment of the board, and amounted to 333, the number being 337 pauper lunatics over and 4 private patients under the number for 1880. The distribution also of pauper patients in private dwellings continues to show considerable increase, the number for the period under review being 52; it should be remembered, however, in this connection, that in Scotland no pauper lunatics are accommodated in private asylums, the public establishments alone receiving them. The admission of voluntary patients in the year amounted to 38, this number 11 less than in 1880, and the same figure under the average admission between 1875–79. We have for some years been able to say that nothing has occurred to indicate any difficulty or disadvantage traceable to the presence of

* *Insanity in France.*—The four Parisian asylums are the Bicêtre, Salpêtrière, Charenton, and St. Anne. All the inmates live much in the open air. Water, as a means of treatment, is much used, and elaborate means for this are provided. Restraint is freely used. Insanity is more active in France than in England and there is more agitation. At Lausanne, in *Switzerland*, no restraint is used. Maniacal attacks are milder here than in France and Italy. At the asylum at Heidelberg, in *Germany*, leather mittens and the wet pack are used to restrain patients. The policy of Germany is that of non-restraint.

this class of patients in asylums; and we continue to be of opinion that it is a useful provision of the law which permits persons who desire to place themselves under care in an asylum to do so in a way which does not require them to go through forms from which they naturally shrink, and yet affords sufficient guarantee against abuse. At the visits of the medical commissioner to asylums all voluntary inmates are seen, and they have then an opportunity of making statements in regard to their position, should they desire to make any. Where there is reason to suppose that they in any way fail to understand the conditions of their residence, we consider it proper to explain these conditions; but we have never found that the nature of their position has been intentionally concealed from them. Discharges numbered among recovered patients, no fewer than 1188; 206 private and 982 pauper. These figures are both higher in respect to annual rates and to averages."

The thirty-sixth report of the Commissioners in Lunacy in England yields confirmatory evidence respecting the suspected increase in lunacy in that country. "The large increase noticed in the number of lunatics last year is almost entirely among the pauper classes, the private patients remaining comparatively stationary. The figures for 1881 show an increase of 1801 as compared with those relating to 1880; the average annual increase of pauper patients for the preceding years having been only 1507." During the year dealt with in this report 17 deaths by suicide occurred in county and borough asylums. In three cases the patients were away on trial.

Dr. G. H. Blandford, of England, in writing on the treatment of insanity says: "Our object should be to restore to health the disordered brain, to cause the incessant waste to cease, to promote a storing and not an expenditure of nerve-force. The brain must be nourished by healthy blood. The quantity of the latter when in defect must be increased; when its quality is in fault it must be improved; and when the blood-flow is in excess it must be checked; while all causes of disturbance reacting upon the brain from other organs of the body must be removed." He also wisely says: "Many persons at the very outset of insanity may by removal and judicious treatment be cured, if their friends will only open their eyes and acknowledge the threatening evil, and not wait, as they so often do, till compelled by circumstances to interfere, etc. Patients' friends constantly make a mistake; they keep the patient out of an asylum at the time asylum treatment would cure him, and send him there

when all hope of cure is over, and when as a chronic lunatic he would be just as well off out of one."

"To procure sleep no drug in his experience approaches chloral in value, and few are the cases where it is totally inefficacious. He has failed to perceive the pernicious effects attributed to it by some writers, and the results both in severe and slight cases have been most satisfactory. In the melancholic and non-excited cases the preparations of opium are of great service, alone, or in combination with chloral. In excitement, bromide of potassium is valuable, alone, or in combination with chloral, Indian hemp, or henbane. Calabar bean is useful in general paralysis. Good and abundant food is an essential in the treatment of the insane; stimulants are required in many cases, particularly the depressed and anæmic forms, but in the opposite, though often useful, they in some cases produce or increase excitement, especially in the early stage. With the food tonics should be given, and those best suited are, in the writer's experience, the mineral rather than the vegetable, and chief of all, the preparations of iron."

I regard the following, written thirty years ago by the late eminent Dr. Forbes Winslow, as very valuable to the profession, and accordingly insert it:

On the Medical Treatment of Insanity.—It is necessary that we should, before being able to appreciate the effect of medical treatment, entertain just and enlightened views as to the *curability of insanity.* I now speak from a somewhat enlarged experience, from much consideration of the matter, and I have no hesitation in affirming that, if brought within the sphere of medical treatment in the earlier stages, or even within a few months of the attack, insanity, unless the result of severe physical injury to the head, or connected with a peculiar conformation of chest and cranium, and an hereditary diathesis, *is as easily curable as any other form of bodily disease for the treatment of which we apply the resources of our art.* It is a lamentable error to suppose, and a dangerous, a false, and unhappy doctrine to promulgate, that the disordered affections of the mind are not amenable to the recognized principles of medical science. I again declare it to be my positive and deliberately-formed opinion that there are few diseases of equal magnitude so susceptible of successful medical treatment in the incipient form as those implicating the normal action of thought. The vast amount of incurable cases of insanity which crowd the wards of our national and private asylums is pregnant with important truths. In the history of these unhappy persons—these lost and ruined minds—we read recorded the sad, melancholy, and lamentable results of either a total neglect of all efficient curative treatment at a period when it might have arrested the onward advance of the cerebral mischief and maintained reason upon her seat; or of the use of injudicious and unjustifiable measures under mistaken notions of the nature and pathology of the disease. In no class of affections is it so imperatively necessary to inculcate the importance of early and prompt treatment as in the disorders of the brain affecting the manifestations of the mind. I do not maintain that our curative agents are of no avail when the disease has

passed beyond what is designated the "curable stage." My experience irresistibly leads to the conclusion that we have often in our power the means of curing insanity, even after it has been of some years' duration, if we obtain a thorough appreciation of the physical and mental aspects of the case, and perseveringly and continually apply remedial measures for its removal; but I cannot dwell too strongly upon the vital necessity of the early and prompt exhibition of curative means in the incipient stage of mental derangement.

I believe insanity (I am now referring to persistent insanity, not those transient and evanescent forms of disturbed mind occasionally witnessed) to be the result of a *specific morbid action of the hemispherical ganglia, ranging from irritation, passive and active congestion, up to positive and unmistakable inflammatory action.* This state of the brain may be confined to one or two of the six layers composing the hemispherical ganglia; but all the layers are generally more or less implicated, in conjunction with the tubular fibres passing from the hemispheres through the vesicular neurine. This specific inflammation, from its incipient to the more advanced stage, is often associated with great vital and nervous depression. It is, like analogous inflammation of other structures, not often accompanied by much constitutional or febrile disturbance unless it loses its specific features and approximates in its character to the inflammation of active cerebritis or meningitis. This state of the hemispherical ganglia is frequently conjoined with active sanguineous circulation and congestion, both of the substance of the brain and its investing membranes. The morbid cerebral pathological phenomena, viz., the opacity of the arachnoid, the thickening of the dura mater, its adhesions to the cranium, the depositions so often observed upon the convoluted surface of the hemispheres and on the meninges, the hypertrophy, scirrhus, the cancerous affections, the induration, the depositions of bony matter in the cerebral vessels and on the dura mater, the serous fluids in and the ulcerations upon the surface of the ventricles, the alterations in the size, consistence, color, and chemical composition of the vesicular neurine and fibrous portion of the brain—are all, in my opinion, the results, the sequelæ, more or less, of that specific inflammatory condition of the hemispherical ganglia to which I have referred. It does not necessarily follow that the *fons et origo mali* of insanity is invariably to be traced to the brain. The preliminary morbid action and irritation are often situated in the heart, the stomach, the liver, the bowels, the lungs, or the kidneys, the brain being secondarily affected; nevertheless, in all cases inducing actual insanity, the hemispherical ganglia are involved in the morbid action. The most recent pathological doctrine propounded to explain the phenomena of insanity—I refer to the views of a recent writer—that derangement of mind is the effect of "*loss of nervous tone*," and that this loss of nervous tone is "*caused by a premature and abnormal exhaustibility of the vital powers of the sensorium*"—conveys to my mind no clear, definite, or precise pathological idea. It is true that we often have, in these affections of the brain and disorders of the mind, "loss of nervous tone" and "exhaustion of vital power," but, to my conception, these are but the *effects* of *a prior morbid condition of the encephalon*, the *sequelæ* of specific inflammation of the hemispherical ganglia. To argue that insanity is invariably and exclusively the result of "loss of nervous tone," is to confound cause and effect, the *post hoc* with the *propter hoc;* and would, as regards therapeutical measures, act as an *ignis fatuus*, alluring us, as pathologists, from the right and legitimate path. I feel anxious that my views upon this important subject should be clearly enunciated and not open to misconception. I think much mischief has arisen from a belief in the existence of active ordinary cerebral inflammation in cases of insanity, for it has led to the adoption of treatment most destructive to life and has seriously interfered with the permanent restoration of the reasoning powers. Nevertheless, insanity is occasionally complicated with acute

cerebral symptoms sufficient to justify us in the cautious use of somewhat active measures for its removal. We must avoid the fatal error of a too rapid process of generalization, and be careful of not looking to symptoms instead of to the disease itself, and of permitting ingenious and well-constructed *a priori* theories of the nature of insanity to dazzle our imaginations and abstract the mind from the steady and patient investigation of pathological science and individual cases of disease. If we allow our judgment to be warped by the inflammatory theory on the one side (I am now speaking of *ordinary* not of *specific* inflammation), and conclude that the excitement of mania is to be subdued by copious depletion or the administration of antiphlogistic measures; or if, on the other hand, we adopt the speculative opinions of those who belive that in every case of insanity, irrespective of its origin, its progress, or its character, there exists "mere loss of nervous tone" caused by "a premature abnormal exhaustibility of the vital powers of the sensorium," how lamentably shall we be misled as to the real character of insanity and in the application of our therapeutic agents! These circumscribed and partial views of the pathology of insanity often, alas, lead to serious solecisms in practice. In 90 per cent. of the cases of acute mania there is found in the brain and its meninges a state of sanguineous congestion, particularly of the hemispherical ganglia, combined with alterations in the gray nervous matter. In forming an opinion of the actual pathological condition of the cerebral substance we should remember that, particularly in public asylums, it is a rare occurrence for recent cases to be admitted; that the acute and subacute active cerebral conditions have subsided and the disease has assumed a chronic form before the patient is examined and placed under treatment; consequently many deductions recorded by pathologists have been based upon the study of chronic and not of acute mania. A large percentage of the cases, before admission into our national asylums, have passed through the primary and acute stages, and have probably been subjected to medical treatment. This fact must never be lost sight of in forming our opinion not only of the nature of the disease itself, but of the medical treatment necessary for its cure. In private practice the acute forms of insanity are often met with, but even with the advantages which the physician can command of investigating the earlier stages of deranged mind, he often discovers that the mental affection has been allowed to exist and slowly progress for a considerable period, no treatment, either medical or moral, having been adopted for its removal. If the incipient form of insanity, particularly when it manifests itself in plethoric constitutions, has been sudden in its development, is the result of physical causes, and is connected with the retrocession of gout, or is rheumatic in its character, there can be no doubt the nature of the changes induced in the brain is more allied to that of inflammation than that of nervous exhaustion. The attacks from the slow and insidious operation of moral causes are less likely to be accompanied by active symptoms. In many instances the maniacal excitement is *asthenic* or *atonic* in its character, resembling the delirium of the last stages of typhus fever.

The most simple classification of insanity—the one best adapted for useful and practical purposes—is its division into the *acute* and *chronic* forms; the insanity ushered in by *excitement* or by *depression* into *mania* and *melancholia*—*amentia* and *dementia*. The minute divisions and subdivisions, the complicated and confused classification to be found in books may serve the ostentatious purposes of those desirous of making pompous display of scientific lore, but I think they have tended to bewilder and obscure the understanding of the student and lead the man in search of practical truth from the investigation of the disease itself to the mere study of its symptoms and to the consideration of unessential points and shades of difference. Adhering to this division of the subject, each form should be viewed in relation to its *complications* as well as to its *associated diseases*. Among the former are epilepsy, suicide, homicide, paraplegia, hemiplegia, and general

paralysis. The associated diseases implicate the lungs, heart, liver, stomach, bowels, kidney, bladder, and skin.

Before speaking of the preliminary examination of the patient supposed to be insane and the prognosis in cases of insanity, I would premise that those inexperienced in the examination of this class of cases would often arrive at false and inaccurate conclusions if they were not cognizant of the fact that the insane often describe sensations which they have never experienced, and call attention to important symptoms which have no existence except in their own morbid imaginations. A patient will tell you that he has a racking headache or great pain and tenderness in the epigastric region, both symptoms being the fanciful creations of his diseased mind. This is particularly the case in the hysterical forms of insanity, in which there always exists a disposition to pervert the truth and exaggerate the symptoms. Again, serious bodily disease may be present, the patient not being sufficiently conscious to comprehend the nature of the questions asked or able to give intelligible replies to the anxious interrogatories of the physician. Insanity often masks—effectually obscures—other organic affections, the greater malady overpowering the lesser disease. When *Lear*, *Kent*, and the *Fool* are standing alone upon the wild heath, exposed to the merciless pelting of the tempest, *Kent* feelingly implores the king to seek shelter from the "tyranny of the open night" in an adjoining hovel; it is then that *Lear* gives expression to the psychological truth just referred to:

> "Thou think'st 'tis much that this contentious storm
> Invades us to the skin; so 'tis to thee;
> But *where the greater malady is fixed,*
> *The lesser is scarce felt;*
> . . . . . The tempest *in my mind*
> Doth from my senses take *all feeling else*
> *Save what beats there.*"

Disease of the brain may destroy all apparent consciousness of pain and keep in abeyance the outward and appreciable manifestations of other important indications of organic mischief. Extensive disease of the stomach, lungs, kidneys, bowels, uterus, and heart have been known to have progressed to a fearful extent without any obvious recognizable indication of the existence of such affections. Insanity appears occasionally to modify the physiognomy and symptomatology of ordinary diseases and to give them peculiar and specific characteristic features.

Again, it is necessary for the physician to watch the operation of medicine in masking important diseases. The different forms of narcotics, if given in heroic doses, often mislead us in our estimate of the nature of bodily diseases not directly connected with the mental affection. The most essential preliminary matters of inquiry have relation to the age, temperament, previous occupation and condition in life of the patient. It will be necessary to ascertain the character and duration of the attack; to ascertain whether it has resulted from moral or physical causes; if of sudden, insidious, or of slow growth; whether it has an hereditary origin, or is the effect of a mental shock, or of mechanical injury; whether it is the first attack, and, if not, in what features it differs from previous paroxysms. It will also be our duty to inquire whether it is complicated with epilepsy, paraplegia, or hemiplegia, suicidal or homicidal impulses. If any prior treatment has been adopted we must ascertain its nature; whether the patient has suffered from gout, heart disease, rheumatism, cutaneous affection, or syphilis. It is important, in cases of females, to obtain accurate information in relation to the condition of the uterine functions and to ascertain the state of the moral affections. We should also inquire whether the patient has been suspected of habits of self-abuse. Having obtained

accurate information upon these essential points, our own personal observation will aid us in ascertaining the character of the mental disturbance; the configuration of the head, chest, and abdomen; the gait of the patient, the degree of sensibility and volitional power manifested; the state of the retina, the pulse, the urine, and temperature of the scalp and body generally; the condition of the skin and chylopoietic viscera; the action of the heart, lungs, and nature of any existing disease of the uterus. If a patient complains of any local mischief, however imaginary it may appear to be at the time, it is essentially necessary that we should clearly satisfy our minds upon the point before dismissing it as not entitled to serious investigation. A patient once bitterly complained of retention of urine; upon examination, the bladder was found to be distended and the man had passed no urine for twenty-four hours. I was about to enter a catheter, when the patient burst into a fit of laughter and immediately emptied his bladder. Esquirol relates the case of a merchant who, whilst suffering from melancholia, declared that some foreign body was sticking in his throat. No notice was taken of this supposed fanciful idea. The patient died, and an ulcer was discovered at the upper third of the œsophagus. A patient complained of devils being in his stomach and bowels, and declared that they were acted upon by electric, magnetic agencies. After death he was found to have scirrhus of the stomach and chronic inflammation of the bowels. A patient refused to eat; he said he could not swallow his food without great pain. As he had exhibited other symptoms of a disposition to suicide, it was thought by myself and others that his obstinate refusal of food was associated with ideas of self-destruction. He died, and at the post-mortem examination a stricture in the pylorus was discovered. These illustrations, and they could easily be extended, will prove the importance of paying minute attention to particular delusions with the view of ascertaining whether they have not a particular and *actual* physical origin.

The *prognosis* in cases of insanity will mainly depend upon the duration of the attack, its character and origin, and the diathesis of the patient. The prognosis is generally unfavorable if the disease is hereditary—if the symptoms are similar in character to those exhibited by other members of the family when insane. Insanity, accompanied by acute excitement, is, *cæteris paribus*, more easy of cure than when it has been of slow and gradual growth and is marked by great mental depression. The prognosis is favorable in cases of puerperal mania; it is unfavorable when there exists a want of symmetry between the two sides of the head, with small anterior and large posterior cerebral development. Any great inequality in the cranial conformation would be a suspicious indication. The existence of any malformation in the development of the chest is also an unfavorable sign, and would induce us to give a guarded prognosis. Dr. Darwin says, when a person becomes insane who has a small family of children to absorb his attention, his prospect of recovery is but small, as it establishes that the maniacal hallucination is more powerful than those ideas which usually interest us most. The prognosis is unfavorable when patients are under the morbid delusion that they are poisoned and are constantly suffering internally from peculiar sensations. Religious delusions are more difficult to eradicate than other morbid impressions. The age of the patient will materially guide us in forming a correct prognosis. Hippocrates says the insane are not curable after the fortieth year; Esquirol maintains the greater portion recover between the ages of twenty and thirty; Haslam between the ages of ten and twenty. As a principle, we may conclude that the probability of recovery in any given case is in proportion to the early age, physical condition, and duration of the attack. When a patient has youth and a good constitution to aid him, and is advantageously placed, having at command remedial measures, and is excluded from all irritating circumstances, the prognosis may be favorable. I have seen patients after the advanced age of

sixty and seventy recover, and cases of cure are upon record where insanity has existed for ten, fifteen, and twenty years. In forming our prognosis it is important to ascertain the educational training of the patient. Has he been in the habit of exercising great self-control? Has his mind been well-disciplined? Has he kept in abeyance the passions, or have the motions and impulses of his nature obtained the mastery over him? He who has been taught to practice self-denial and self-control in early life is, *cæteris paribus*, in a more favorable position for recovery than he who has permitted himself to be the willing and obedient slave of every passion and caprice. Insanity accompanied with criminal propensities is said to be incurable, because, as Ideler urges, such patients "cannot bear the torments of their consciences, and relapse into the stupefaction of insanity to flee from the consciousness of their guilt." The prognosis is unfavorable when the insanity is complicated with organic disease of the heart and lungs, with deafness, and paralysis in any of its forms. Lesions of the motor power are very unfavorable indications. Great impairment of mind, accompanied with delusions of an exalted character and associated with paralysis, is generally incurable. Esquirol says, epilepsy, if associated with insanity, places the patient beyond all prospect of cure. I should be loath to adopt this sweeping condemnation. I have seen cases of epilepsy, combined with mental derangement, recover, although, I admit, they constitute a difficult class of cases to manage.—*Lancet*, October 8th, 1852, p. 321.

[As it would be impossible to describe in detail the particular class of remedial agents adapted to each class of deranged minds, in the succeeding lecture the subject has been generalized,—the most prominent kinds of insanity, and the difficulties of their management, only being discussed.]

In regard to the treatment of acute mania, the important and much-litigated question at issue among practitioners of all countries, is that relating to the propriety of depletion. Need I direct your attention to the conflicting and contradictory opinions entertained by eminent writers on this important and much-vexed therapeutical point? Whilst some practitioners of great repute and enlarged experience fearlessly recommend copious general depletion for the treatment of insanity, and refer to cases in which this practice has been attended with the happiest results, others, equally eminent, and as much entitled to our respect, denounce the lancet as a most fatally dangerous weapon, and shudder at the suggestion of abstracting, even locally, the smallest quantity of blood. In avoiding Scylla we must be cautious of being impelled into Charybdis. The error consists in a vain effort to discover a uniform rule of treatment, and attempting to propound some specific mode of procedure adapted to all cases. He who maintains that bloodletting is never to be adopted in the treatment of mania, without reference to its character, its origin, the peculiar constitution of the patient, and the existence of local physical morbid conditions, which may be materially modifying the disease, and giving active development to delusive impressions, is not a safe practitioner. Neither would I confide in the judgment of the physician who would, in every case of violent maniacal excitement, attempt to tranquillize the patient by either general or local depletion.

In attacks of insanity, when the symptoms are acute, the patient young and plethoric, the habitual secretions suppressed, the head hot and painful, the eyes intolerant of light, the conjunctiva injected, the pupils contracted, the pulse rapid and hard, and the paroxysm sudden in its development, *one* general bleeding will often arrest the progress of the cerebral mischief, greatly facilitate the application of other remedies, and ultimately promote recovery. In proportion as the symptoms of ordinary insanity approach those of phrenitis, shall we be justified in the use of general depletion. Although it is only occasionally, in instances presenting peculiar characteristic features,—cases occurring in the higher ranks of life, where the patient has been in the habit of living *above par*, and is of a san-

guineous temperament,—that we are justified in having recourse to the lancet, there is a large class of recent cases presenting themselves in the asylums for the insane, both public and private, in the treatment of which we should be guilty of culpable and cruel negligence, if we were to omit to relieve the cerebral symptoms by means of the local abstraction of blood. It is, alas! the fashion and caprice of the day to recklessly decry the application of cupping-glasses or of leeches in the treatment of insanity, in consequence, I think, of the slavish deference shown to the opinion of a few French pathologists of eminence, who have, by their indiscriminate denunciation of *all depletion*, frightened us into submission, and compelled us to do violence to our own judgment. The local abstraction of blood is, in the hands of the discreet and judicious practitioner, a powerful curative agent; and yet it is the practice of some men, and men, too, of position, to discard altogether the remedy.

I will briefly refer to the kind of case in which the local abstraction of blood will be found most beneficial, if proper regard be had to the temperament, constitutional condition, and the local circumstances modifying the character of the attack. In insanity, when the exacerbations occur at the menstrual period, *cæteris paribus*, leeches to the vulva and thighs, with the use of foot-bath, and the exhibition of aloetic purgatives, will be attended by the most favorable results. In irregular and obstructed menstruation, the local abstraction of blood will be very serviceable. In suppressed hæmorrhoids, leeches to the neighborhood of the sphincter ani will greatly benefit in unloading the hæmorrhoidal vessels, and relieve the brain of undue excitement. In cases of nymphomania, leeches to the vulva are indicated, and have been known to greatly benefit. In cases of intermittent insanity, the paroxysm may often be cut short by relieving the overloaded state of the vessels of the head by means of cupping or the application of leeches. In some instances, I have tried Dr. Wigan's plan, and have applied leeches to the Schneiderian membrane, particularly for the treatment of insanity of early life, and connected with conduct evidently the effect of cerebral irritation. I have seen this mode of procedure of essential benefit in persons of plethoric constitution and of sanguineous temperament. Occasionally the insanity is found to be associated with active visceral disease, or with hypertrophy and other affections of the heart. Under these circumstances, when there exists great tenderness over the region of any of the visceral organs, and we are satisfied, by a careful stethoscopic examination, that hypertrophy of the heart is present, leeches applied over the seat of the local mischief, conjoined with other appropriate treatment, will materially aid us in subduing the maniacal affection. In cases of illusions of hearing, or of vision, it will often be necessary to apply leeches behind the ears, or over the superciliary ridges. I have known this practice entirely remove the morbid illusions which had been embittering the person's life.

But apart entirely from the local affections to which I have referred, for the treatment of idiopathic insanity, apparently without any complications, or modified by any of the associated diseases, the careful and temperate local abstraction of blood, when general depletion is inadmissible, will often materially shorten the duration of an attack of insanity, and restore the mind to a healthy condition. I am anxious to record my favorable opinion of this mode of treatment, because I have witnessed so many sad results from an opposite, timid, and reprehensible neglect of the means placed within our power for the treatment of the varied forms and degrees of mental derangement. Sad consequences have undoubtedly followed the indiscriminate use of depletory measures; the presence of violent mental excitement has occasionally led the practitioner to the conclusion that the disease was of an active character; and in the attempt to allay the undue cerebral excitement by means of antiphlogistic measures, the patient has sunk into incurable and hopeless de-

mentia. But recognizing an *anæmic* class of cases, where great excitement is often associated with loss of nervous and vital power, we must be cautious in permitting serious disease to be creeping stealthily on in the brain, no effort being made to relieve the congested cerebral vessels or inflamed tissue, until serious disorganization has taken place in the delicate structure of the vesicular matter, and the patient is forever lost. In the treatment of acute mania, the remedy next in importance to cautious depletion is that of *prolonged hot baths*. To Dr. Brierre de Boismont, of Paris, at whose excellent institution I first witnessed the application of this remedial agent, the profession is indebted for reviving a practice which had long fallen into disrepute. In treatment of acute mania, the prolonged hot baths will be found of the most essential service. Dr. Brierre de Boismont has recorded the history of sixty-one of seventy two cases that were subjected to this mode of treatment. Three-fourths of this number were cured in a week, and the remainder in a fortnight. The patients remain from eight to ten and fifteen hours in warm baths, whilst a current of cold water is continually poured over the head; the temperature of these baths is from 82° to 86° Fahr.; the affusions 60° Fahr. Among the therapeutic effects of these baths, Dr. B. de Boismont reckons a diminution of the circulation and respiration, relaxation of the skin, alleviation of thirst, the introduction of a considerable quantity of water into the economy, an abundant discharge of limpid urine, a tendency to sleep, a state of repose. This mode of treatment is said to be ineffectual in cases of periodic intermittent mania, in mania beginning with great mental impairment, or associated with epilepsy or general paralysis. The result of my own experience of this plan of treatment has produced a very favorable impression upon my mind, and I think it is entitled to a fair trial in all our public asylums where they admit acute and recent cases.

In some forms of acute mania it is desirable, as a substitute for depletion, to diminish the activity of the circulation by the exhibition of nauseating doses of the tartrate of antimony; it may be serviceably combined with the tinctures of digitalis and hyoscyamus. This remedy, however, requires careful watching, as it often has been known to suddenly reduce the vital powers to a low ebb, and extinguish life. It will be found beneficial in proportion to the recent character of the case, and the positive activity of the cerebral circulation. The tincture of digitalis was formerly in great repute as an anti-maniacal remedy; the experience of late years has not encouraged us in administering it in the doses prescribed by some of the old writers; nevertheless, it is a useful agent, and occasionally proves a valuable auxiliary in the hand of the practitioner who carefully watches its operation.

For the cure of the acute forms of insanity the douche bath has been much lauded; but this remedy is now rarely used in British asylums. I have occasionally seen benefit derived from its exhibition, but it requires great caution in its use. A patient has been subjected, whilst in a paroxysm of acute delirium, to the douche bath, and has sunk almost immediately into incurable idiocy! The physical shock has occasionally been known to produce a good moral impression. For illustration: a patient imagined himself emperor of the world, and would not allow any one to address him by any other title. The immediate application of the douche bath destroyed his idea of royal dignity, and he was willing to admit that he had never been, nor was at any time a regal personage. A few hours subsequently the delusive impression returned in all its original force; the douche bath was again had recourse to, and a second time the morbid impression vanished; by a series of baths he was restored to sanity, and after his complete recovery, when the particulars of his case were placed before him, he observed, "Why did you not whip me, and beat this nonsense out of my head? I wonder how you could have borne with my folly, or I have been guilty of such contemptible arrogance and obsti-

nacy." As a substitute for the douche, the shower bath is often used with great benefit, particularly in certain forms of melancholia, associated with nervous depression and general debility. In cases of melancholia, or other kinds of chronic insanity connected with a congested state of the liver, the nitro-muriatic bath will occasionally do much good. In a few instances I have noticed marked benefit from Bertolini's sedative bath, composed of henbane two pounds, and equal parts of hemlock, and cherry-laurel leaves, well infused in a sufficient quantity of hot water. But the simple hot bath in certain conditions of the nervous system, particularly in some forms of suicidal mania, is of the utmost benefit. A warm bath a short period before retiring to rest, bathing the head at the same time with cold water, particularly if the scalp be unnaturally hot, will often insure a quiet and composed night, when no description of sedative, however potent its character and dose, would influence the system.

In the early stages of insanity, and throughout its whole course, the bowels are often in an obstinately constipated condition. The concentration of nervous energy in the brain appears to interfere with that supply which should proceed to other structures; consequently there appears to be a want of healthy sensibility in the mucous membrane of the bowels, and an interruption to the peristaltic action of the intestinal canal. There is no class of agents which act so certainly and effectually in relieving the mind when under the influence of depressing emotion, as cathartics. The ancients considered hellebore as a specific in certain forms of melancholia. In the hands of modern practitioners it has not been found to merit the high encomiums which have been passed upon it. It is important in every case of insanity, but particularly in the acute stages of mental derangement, to act powerfully upon the bowels by means of a succession of brisk cathartics. The bowels are often found gorged with fecal matter, and immediate relief often follows the administration of two or three doses of calomel and colocynth, or of croton-oil. It will often be necessary to assist the operation of the cathartics by means of enemata. In hysterical and some other forms of insanity there is always a disposition on the part of the patient resolutely to resist the calls of nature, and, knowing this peculiarity, we must carefully watch the condition of the bowels, otherwise serious mechanical obstructions may ensue, followed by intractable diseases of the rectum. Insanity is often associated with gastric and intestinal disease, with an irritable condition of the mucous membrane of the alimentary canal; and, in such cases, although it is important to relieve the bowels and prevent them from being constipated, we must bear in mind that the injudicious exhibition of irritating drastic cathartics may aggravate the mental disease, by increasing the gastric and intestinal irritation, and thus do permanent and irremediable mischief. Much injury may arise from the indiscriminate and injudicious administration of cathartics. In insanity associated with menstrual obstructions, it will be necessary to exhibit the class of purgatives known to act specifically upon the lower bowel; consequently aloetic cathartics, such as the compound decoction of aloes, are found of most service in these cases. In plethoric habits, when there is a marked determination of blood to the head, no medicine will relieve so speedily as active doses of the compound powder of jalap.

In the treatment of insanity, the class of medicines termed *sedative* play an important part. If exhibited with judgment, the most gratifying results often follow *their continuous and persevering administration.* The sedative treatment of insanity is a subject of itself, and I quite despair of touching even upon the confines of many interesting and important points involved in the consideration of this division of my lecture. In insanity unassociated with active cerebral circulation, congestion, or paralysis, or after the head symptoms have been relieved by the local abstraction of blood and the administration of

appropriate medicine, the exhibition of sedatives will be followed by the most beneficial results. In recent cases they are generally inadmissible, except in delirium tremens and puerperal insanity, and other forms of derangement analogous in their pathological character and symptoms to these affections. In chronic insanity, in melancholia unconnected with abdominal repletion, or visceral disease, the persevering use of sedatives in various combinations will often re-establish sanity, when no other course of treatment is likely to be successful in dispelling the illusive impressions, or raising the drooping and desponding spirits. Battley's solution, the tincture of opium, the meconite, acetate, and hydrochlorate of morphia, the preparations of hyoscyamus, conium, stramonium, camphor, hops, aconite, ether, chloroform, hydrocyanic acid, Indian hemp, are all of great and essential service if administered with judgment and sagacity. In suicidal insanity, when local cerebral congestion is absent, and the general health and secretions are in good condition, the meconite and hydrochlorate of morphia often act like a charm, *uninterruptedly and perseveringly given* until the nervous system is completely under its influence. I have witnessed the most distressing attacks of suicidal mania yield to this treatment, when every other system has failed. I could cite the particulars of numerous cases of this form of insanity radically cured by the occasional local abstraction of blood from the head, the administration of alteratives, the warm bath, and sedatives. In the use of this powerful curative agent, our success will often depend upon a *ready adaptation of the kind of sedative to the description of case in which it may be deemed admissible, and a judicious combination of various kinds of sedatives.* I do not think we pay sufficient attention to such combinations. I have often seen an apparently incurable and unmanageable case yield to several kinds of sedatives combined, when it resisted the operation of any one or two. The extract of conium is often of service in cases of insanity combined with epilepsy; conjoined with mineral tonics, conium is occasionally of benefit, particularly in melancholia connected with chronic diseases of the digestive organs and with neuralgia. In cases of uterine irritation, I have seen great good result from the combination of hops, camphor, and hyoscyamus. In illusions of vision, belladonna, commencing with quarter-grain doses, will be found a useful remedy. In insanity complicated with dysmenorrhœa, the combination of camphor with hyoscyamus, opium or conium, may be given with great advantage. The hydrochlorate of morphia, in union with dilute hydrochloric acid, is said to be useful in cases where the sedative treatment is desirable. I am often in the habit of exhibiting sedatives and tonics in a state of combination, particularly conium with iron, opium with quinine, or with the infusion or compound decoction of cinchona. In debility, with irritability of the nervous system, accompanied by restlessness, Battley's solution, with the preparations of cinchona, will often prove of great benefit. The tincture of sumbul I have occasionally administered, and I think with advantage, in paroxysmal or convulsive forms of insanity. I have given to the extent of one or two drachms for a dose. In hysterical derangement, the tincture of Indian hemp will occasionally allay the excitement, and produce sleep more rapidly than any other form of sedative. The valerianate of zinc has not answered the expectations of those who have spoken so highly of its medicinal virtues. Tincture of opium with camphor, and the tartrate of antimony, is an excellent combination in cases of doubtful cerebral congestion. Tincture of hops, in doses of from one to four drachms, it will be necessary to give when no other formulæ are admissible. As a mild form of sedative, compound ipecacuanha powder is occasionally recommended; but a good substitute for Dover's powder is a pill composed of opium, ipecacuanha, and soap.

In treating the more chronic forms of insanity, particularly melancholia, it will be es-

sential to bear in mind that they are difficult of cure, because, owing to the slow, obscure and insidious character of the disease, the mental affection has been of some duration before the attention of the practitioner has been directed to its existence. As this form of derangement generally exhibits itself in trifling perversions of the affections and propensities, leading to little acts of extravagance and irregularity of conduct, associated with great depression, we often find the attack has existed some years before a necessity is felt for any medical advice or treatment—perhaps a suicidal propensity has manifested itself, this being the first apparent overt act of the insanity.

It is necessary, before suggesting any course of treatment in melancholia, to ascertain whether any latent visceral disease be present. Occasionally the local irritation will be found either in the liver, or the stomach and bowels, and in women the uterine functions are frequently disordered. In the religious and other forms of melancholia in females, the delusive ideas are often associated with uterine irritation; and under such circumstances, if actual physical derangement of an active character exists in this organ, the best treatment will be, the application of leeches to the neighborhood of the uterus, combined with warm hip-baths, sedatives and mineral tonics. In cases of melancholia, the digestive functions are often much vitiated, the circulation languid, the skin cold and flaccid; and these symptoms being conjoined with a general loss of physical tone, such patients require generous diet, good air, gentle exercise, and occasional stimuli. When dyspeptic symptoms are combined with an inactive state of the bowels, I have often administered the compound tincture of guaiacum with great benefit. It is important to watch the particular features in these cases, and to improve the general health by the exhibition of mild alteratives and vegetable tonics, with alkalies. I have occasionally administered, with success, in this form of insanity, apparently associated with an abnormal condition of the nutrition of the brain, cod-liver oil, with preparations of iron.

My time will not admit of my submitting for your approval the treatment best adapted for those forms of mental disease associated with an atrophied or softened condition of the nervous matter. I think more is to be done for the cure of these cases than the writings of medical men would lead the student to suppose, particularly if the disease be seen and subjected to treatment in the early stages. I have recorded the details of several instances of cerebral disease, exhibiting all the legitimate features of ramollissement, and yielding to the persevering administration of the preparations of iron, phosphorus, zinc and strychnia, combined with generous living, and the occasional application of a leech behind the ear, should indications of cerebral congestion be present. I have also derived benefit in these cases from the use of the milder forms of mercury, associated with cinchona. In cases of impairment of the mind, loss of memory, defective power of attention, occasional paroxysms of *mental* paralysis, unconnected with lesions of the *motor* power, I have found a solution of the acetate of strychnine, and a solution of the phosphate of strychnine, of great advantage.

In some chronic forms of insanity, in dementia, and persistent monomania, connected, as it was supposed, with morbid thickening of the dura mater, and with interstitial infiltration of the membranes, as well as with exudations upon its surface, I have occasionally had the head shaved, and have perseveringly rubbed over the scalp a strong ointment of the iodide of potassium combined with strychnine. In other instances I have kept the head painted with the mixture of iodine. I have seen marked benefit from this mode of treatment. In several cases where the mental symptoms were supposed to be associated with effusions of serum, I have ordered the iodine to be applied externally, at the same time exhibiting minute doses of calomel, or mercury with chalk, to slightly affect the system; this, conjoined with occasional tonics, diuretics, and stimuli to support the

vital powers and enable the patient to undergo this treatment, is occasionally productive of considerable benefit, in cases apparently placed quite beyond the reach of improvement or cure.

I have only briefly spoken of two distressing and often unmanageable forms of insanity—viz., of suicidal mania, and of those cases where the patient obstinately refuses to take either food or medicine. In insanity associated with suicidal tendencies, it will be important to ascertain whether any cerebral congestion exist, as such is often the case. A few leeches applied to the head, followed by an active cathartic, will relieve the local irritation, and often dissipate the idea of self-destruction. In the absence of any positive active cerebral symptoms, the prolonged hot bath, and the persevering exhibition of some form of sedative, is the best treatment to be adopted. I have seen the suicidal impulse removed after the administration of a few doses of belladonna; but the meconite and hydrochlorate of morphia, if given for a sufficient length of time, will, in the great majority of cases, distinct from actual incurable visceral or cerebral disease, effect a cure. Occasionally the shower-bath, and counter-irritation in the vicinity of the head, will aid us in re-establishing health. Cases sometimes present themselves where the patient determinately refuses to take either food or medicine. This character of case gives those who have the care of the insane much anxiety. The refusal of food may be connected with the determination to destroy life, or it may be associated with delusive impressions. I am inclined to believe that in the majority of these cases the symptom is the result of some local mischief remote from the brain, and sympathetically affecting the organ of thought. Upon examination we often find, in these cases, great gastric derangement, obstinate constipation, considerable tenderness upon pressure in the epigastric region, hepatic disease, the tongue foul, breath offensive, and other symptoms of derangement of the chylopoietic viscera. The determination to resist nourishment arises, under such circumstances, from a *positive loathing of food—a want of all inclination for it.* I have seen cases of this description, where it has been deemed necessary, in order to prolong life, to introduce food forcibly into the stomach, speedily cured by the adoption of means for improving the state of the general health and digestive organs. Mild alteratives, vegetable tonics, blisters over the region of the stomach, if the patient complains of pain in that region upon pressure, the warm and shower-bath,—is the most successful treatment to adopt in cases connected with obvious visceral derangement. Instances sometimes occur, where the refusal of food is clearly traceable to a delusive impression—an hallucination of taste, which makes everything appear to the patient bitter, disgusting and poisonous. The unhappy patient imagines that he is commanded, either by good or evil spirits, not to eat. These unhappy persons must be treated upon general principles, and the remedies be adapted to the peculiar character of each individual case. Under such hallucinations of taste, patients often swallow the most extraordinary articles. The case of a lunatic is recorded, who imagined that his stomach required to be strengthened with iron. He was seized with inflammation of the œsophagus of which he nearly died. He then confessed that he had swallowed the blade of a knife. After his death, there were found in his stomach seven oxidated lath nails, each two inches and a half long; thirty-three nails, two inches long; forty-nine smaller iron nails and rivets; three pieces of wound-up iron wire; an iron screw, an inch long; a brass image of a saint; part of the blade of a knife; and other articles, amounting in number to 100, and weighing about twenty ounces. It will be necessary, in cases like those to which I have been referring, to ascertain whether the determination not to eat is the effect of such perversion or hallucination of taste.

The time will only admit of my alluding generally to the importance, as a principle of

treatment, of the administration of tonic remedies, active exercise in the open air, and to good and generous living. It is rarely necessary, in the treatment of insanity, to deprive the patient of animal food. Individual cases occasionally come under our notice, in which it is necessary, for a time, to enforce a farinaceous diet; but such is not often our duty. Among paupers, insanity is frequently cured by the free use of good animal food, and a generous supply of porter. Even when we are satisfied of the necessity of local depletion, it will often be necessary to give wine, and allow the patient a generous diet.

There are many other essential points in connection with this important, this vast subject, which I am reluctantly compelled to pass entirely over. When I had resolved to bring this matter before the profession, I quite despaired, in the time allotted for one lecture, of being able to skim even upon the surface of the many deeply interesting points involved in the inquiry; but feeling—deeply, earnestly feeling—that, in relation to my own specialty, the subject of the medical treatment of insanity was of the first moment, of the most vital importance to the profession as well as to the public, I did not hesitate in selecting this topic for one of my lectures, feeling assured that you would kindly make allowance for all imperfections, and generously appreciate the difficulties I had to encounter in concentrating in one short lecture a faint glimpse or shadow of a subject requiring, for its successful exposition, nine or ten lectures, equal in length to the one I have had the honor of reading this evening. I may have formed an extravagant and exaggerated conception of this subject, but I cannot close my eyes to the fatal consequences which have so often ensued from a belief in the incurability of insanity by medical means. In all grades of society, we witness the pernicious, the fatal, the disastrous effects of this dogma. We see it influencing the conduct of county magistrates in the architectural proportions, medical organization, and general arrangements of our great national asylums. We also perceive the consequences of the error operating in many of the private institutions for the treatment of the insane. Alas! are we not compelled to confess that many of the asylums for the insane constitute mere places of detention,—model prisons,—and not what Government ought to insist upon making them—*hospitals for the cure of the insane*, under the government of medical officers, well trained by preliminary education, for their important vocation, acquainted with the philosophy of the human mind, and fitted by the character of their *heart*, as well as by their *intellect*, for the right performance of the solemn and responsible duties intrusted to them by the public and the legislature?

CHAPTER XVI.

THE NECESSITY FOR A NEW METHOD OF INTRODUCING EXPERT TESTIMONY IN CRIMINAL TRIALS, WHERE INSANITY IS ALLEGED AS A DEFENCE.

It would be a reform in our laws relating to insanity, if New York, and other States likewise, could be divided into four or more districts, and a physician in lunacy appointed for each district by the governor. This board of physicians, who should be experts or specialists in nervous and mental diseases, should constitute a State lunacy commission, to visit and report as to the condition of lunatic hospitals, to protect the rights of those who are incarcerated in public asylums, and also strongly support the medical superintendents, who, as a rule, exhibit skill and wisdom of the highest order. The public would feel more assured, perhaps, that no evils or abuses could spring up in our asylums, and also that, if there is any room for improvement, it will be immediately seen by the commissioners in lunacy, if it escapes the superintendent's eye. The Lunacy Commission of Great Britain has been of great benefit, both to the officers and the patients of the English institutions, and it would, I think, be the same in our own country, and would dispel the prejudice existing against our asylums and their managers.

As there is a much-needed reform as to a new method of introducing expert testimony in criminal trials where insanity is alleged as a defence, this same lunacy commission of experts might be of great value in examining such cases and giving testimony upon such trials; it having been provided in the statute by which such commission should be established, that the counsel for the prisoner, in whose behalf the plea of insanity is proposed to be brought forward, should be compelled to notify such board of such proposed plea. This board of experts should have every facility accorded to them, and should then examine the prisoner's mental state, discuss the question, make their conclusions, and should take written memoranda of such examination. They then should appear in court at the trial to testify as to the prisoner's sanity, or irresponsibility if they find him insane, give their written memoranda of the prisoner's examination, and of their opinion of the state of the prisoner's intellect and emo-

tions, the *nature* of the mental disorder and its amount, and whether and in what degree the mental disorder has existed at the period when the crime was committed. In submitting a written statement by the experts, we secure a calm and impartial statement, which may be supplemented in court afterwards, by questions by the judge and counsel. This board of experts should have full power to cause the temporary removal of the prisoner to an asylum, so as to have every opportunity for his examination between the time of his arrest and the trial.

If this board of experts decide that the prisoner is insane, the judge and jury at the trial would doubtless accept their verdict as final, and the prisoner would then be remanded to an asylum, and in such cases as Guiteau's, to an asylum for the chronic insane (as such cases are incurable), there to remain for life, or in cases of ordinary insanity, until a competent superintendent aided by the lunacy commission unanimously pronounced him recovered.

I consider that this would be a very important medico-legal reform, as it would place rich and poor alike on the same footing if they were on trial for their lives, accused of murder. Of course both prosecution and defence could call in other experts as now, if thought best, but this lunacy commission report would be entirely impartial, and the public would know it to be so. All the factors tending to the commission of crime would be attentively weighed, and certain penalties would not be inflicted on the unhappy victim of a diseased imagination. Dr. D. Hack Tuke of England, the eminent alienist, wisely says: "Infliction of punishment must depend upon accountability, and accountability upon free will, and free will upon sanity. What we want to ascertain is not the mere knowledge of right and wrong, but whether the power to avoid doing wrong was sufficiently intact to involve responsibility. In the first place, I think that the magistrate before whom a criminal case is brought, should, if there is any question raised as to the prisoner's sanity, be obliged to order an examination of the prisoner, either by two mental experts or one expert and the jail surgeon. The obvious advantage here, is that we obtain the best opinion we can secure immediately after the crime has been committed. These experts should have full power to cause the temporary removal of the accused to an asylum, so as to have every opportunity for his examination, between his committal and his trial at the assizes. If they regard him as insane, they should be employed to sign the certificate now required by the 27th

and 28th Vict., c. 29, s. 2, when a prisoner in custody awaiting his trial is removed to an asylum. At the trial, the jury should, as at present, decide whether the accused is in a condition to plead, after hearing the opinion of the experts. If judged unable to plead, the prisoner would be confined in the criminal asylum under the same conditions as now. If considered able to plead, a full written report drawn up by the experts should be given in evidence. If the court wishes for any explanation of the report, the experts should be called into the witness box."

The following law as to mental responsibility in Austria, extracted from the criminal code, is very precise and well conceived and most excellent: "If doubts exist whether the accused possesses the use of his reason, or whether he suffers from an affection of the mind by which his accountability may be lost, then must an inquiry into the state of his intellect and emotions by means of two physicians be always ordered. These have to make their report of the result of their observations. They have to put together all the facts influencing their judgment of the intellectual and emotional condition of the accused. They must examine them according to their importance, both separately and when taken together, and if they consider that there exists a derangement of the mind, they must determine the nature of the disease, the species, and the amount of it, and must ground their opinion both on the basis of the written acts and their own observations as to the influence the disease may have exercised and yet exercises on the imagination, impulses and acts of the accused, and whether and in what degree the disturbed state of mind has existed at the period when the crime was committed."

In France the law recognizes the right of the judge d'instruction (or magistrate) to enlighten himself, by obtaining the opinion of men engaged in the practice of mental medicine, whenever he feels in doubt. The *Code of Civil Procedure*, Part I., Book II., Chap. XIV., enacts the mode of nominating experts. The salient points are as follows, viz.:

"When the magistrate perceives during the examination, that the person accused of a crime does not enjoy the full measure of his intelligence, he suspends his examination and makes an order by virtue of which one, two or three experts are requested to examine the accused. He may also have been induced to take this course in consequence of the action of the friends of the prisoner, for after the crime has been committed his friends may say,

'He was insane.' 'Here is the proof. His medical attendant has seen him and attested in a certificate, which we place before you, that such is the fact.' The experts, who make the examination, take an oath, and the particulars of the crime and the prisoner's history as elicited by the magistrate are communicated to them, if they desire them. They then examine the accused, either at his own house if he is provisionally at liberty, or at the prison if he is detained there. The visits of the experts are made freely and without witnesses, just as often as they see fit. The governor of the prison conforms to their wishes and causes the prisoner to be specially inspected by the jail wardens if it is desired. The experts have full powers to insure a thoroughly satisfactory examination in a house or in prison. If the experts are not able to make up their minds, as may happen in cases of feigned insanity, the prisoner may be placed provisionally in an insane asylum, that he may be examined there with still more care and under watchful supervision. The experts see him as often as they please, and having arrived at a decision report to the magistrate. If they report that the prisoner is insane, the magistrate probably accepts their verdict as final, and issues an order of 'non lieu,' or no jurisdiction. The prisoner is now regarded as irresponsible, and remains in an asylum until the superintendent sees fit to discharge him.

"The great trouble is, that dangerous lunatics are often discharged and commit fresh crimes. If the examination by these experts has been instituted by the friends of the prisoner, and they report him *sane* after the family physician pronounces him *insane*, the magistrate then orders an '*expertise*,' that is, other experts are ordered to make a fresh examination. If these experts, who observe the prisoner under the same condition as the former board of experts, decide that the prisoner is insane, the magistrate probably adopts their opinion and the prisoner goes to an asylum. But if the second board of experts appointed by the magistrate also think the prisoner responsible, the prisoner is committed for trial. The president of the court will allow no other physicians to testify on the trial, besides the experts previously ordered to that duty by the magistrate. The counsel for the prisoner only, may set forth the views of the family physician if the latter still maintains the prisoner's insanity. If the president of the court is in doubt as to the mental responsibility of the prisoner, notwithstanding the opinion of the experts, he expresses it to the jury, and has the right to adjourn the trial to the next term in order

to appoint still other experts to examine the prisoner's state of mind. The prisoner is sent back to prison, and is at the disposal of the new board of experts until they have made their report."

I think the French practice, in general, most excellent. They err, however, I think, in not recognizing reasoning mania or emotional insanity as in general an incurable state of chronic insanity, associated as it generally is with congenitally feeble moral powers, a true moral imbecility, and in not remanding such cases when adjudged insane to an asylum for life, as when discharged they will inevitably commit other crimes, as they have often done in England, France, and in our own country.

What we want is, to ascertain the mental condition of the prisoner; to protect him from punishment if he is insane, to protect society from the injury of admitting insanity as a plea, when the act is really criminal, and finally, to avoid discharging those who are found "not guilty, on the ground of insanity," until they are perfectly restored to mental health.

The law of insanity should be more conformable than it is with medical science, as the present law lays down such a definition of madness that nobody is hardly ever really mad enough to be within it. There are many cases where the person is clearly not responsible and yet knows right from wrong. It is a law diametrically opposed to the pathology of insanity, which rules that it is only when mental disease produces incapacity to distinguish between right and wrong, that immunity from the penal consequences is admitted. The law should recognize *the absence of the power of self-control*, and should be altered in the interests of humanity and justice, so as to introduce *as an essential element of responsibility, the power of self-control when destroyed or suspended by mental disease.* We know far more about insanity than they did in the last generation, and it is obviously unfair that laws pertaining to insanity, when the knowledge of that disease was comparatively in its infancy, should not be amended to keep pace with our increased knowledge of the pathology of mental disease. There are many persons born with a predisposition to insanity, and symptoms indicating that disease display themselves at frequent intervals through the whole course of life, but for many years may never reach such a pitch as to induce those in contact with such persons to treat them as insane. When an overt act *is* committed by such persons, can anyone question the value of a careful examination of the past life and acts of the accused? His

life has exhibited the natural history of insanity, and, with our present accurate and trustworthy methods of investigation, a careful and experienced physician in nervous and mental diseases can clearly point out to the lawyer and jurist the unmistakable evidences of mental disease, which the latter, necessarily, alone and unaided, could not discover. The physician and lawyer should mutually aid each other in such investigations, impartially and by the light of science. There should be no rule of law that conflicts with the elementary truths of insanity, on which only such rules should be founded, and medical jurisprudence is of value only so far as it represents the acknowledged truths of science. For instance, in a homicide, even though the reasoning powers be intact, and there be a capacity to distinguish between right and wrong, we may frequently find epilepsy to be the very phase of mental disturbance which prompted the criminal act; and if in any given case I were called upon by a lawyer who laid before me the evidence to be produced at a trial, where the fact of the existence of epilepsy could be plainly established, and I should be asked for my opinion respecting such evidence, I should tell him that he had a good case and that I regarded the prisoner's legal responsibility as presumptively annulled, and that the burden of proof lay on the party that alleged the contrary; as in none of the neuroses is the presence of the elements of moral obliquity, emotions of suspicion as the mainspring of conduct, maniacal fury, sudden ebullitions alternating with periods of lucidity, suicidal and homicidal mania, so conspicuous as in epilepsy, where we find every modification of blind and destructive impulse.

There are also forms of chronic insanity, a prominent example of which has lately been brought to my notice in the case of a young man, in which the mental manifestations are distinguished less by delusions and gross incoherence than by a certain mental irregularity and unsteadiness, easily recognized by one familiar with diseases of the brain, where the mind is agitated and controlled by each new impulse; and yet this form of mental disease under our present law is clearly incompatible with the kind of insanity which annuls criminal responsibility, for, as a rule, all these cases can clearly distinguish between right and wrong. The present law should be amended so as to read that "homicide is not criminal, if the person by whom it is committed is, at the time when he commits it, prevented by any disease affecting his mind from controlling his own conduct."

Finally, I would speak of the immense medico-legal importance

of the recognition of the mental condition that is the precursor of decided insanity. The depression, unwonted excitability, disregard of the minor proprieties of life, the change which comes over the warmest affections, quick changes and rapid transitions in the current of the feelings, sleeplessness, and a complete change of the character and habits, the person, meanwhile, entertaining no delusions, but occasionally losing his self-control, the general air and manner at such times being strongly expressive of the inward emotions; intervals of perfect calmness and self-control, during which the person clearly discerns his true relations to others, and even, perhaps, recognizes the influence which the incipient disease exercises over his feelings and actions, with, finally, the utter downfall of the integrity of the intellect, manifested by the fury of mania or the moodiness, suspicion, depression, and impulses toward self-destruction of melancholia. All these are the successive links forged in the chain of insanity, the study of which is full of interest to the student of mental pathology, who is interested in the amelioration of this scourge of life, and to those who are interested in leading back the wandering mind out of the darkness and mazes of disease into the unclouded light of reason.

CHAPTER XVII.

CODIFICATION OF THE COMMON LAW AS TO INSANITY.

I AM sure that the acute minds of many of our most distinguished physicians and lawyers have not failed to perceive the incongruities and deficiencies of the present law, and yet there are many who seem adverse to any attempt to make the law of insanity more conformable than it is with medical science. Lord Justice Bramwell told the select committee on the homicide bill: "I think that although the present law lays down such a definition of madness that nobody is hardly ever really mad enough to be within it, yet it is a logical and good definition." He further stated that, in his opinion, "the law was right, because it might deter many insane persons from crime by the threat of punishment." Lord Justice Blackburn, in his testimony before the select committee on the homicide bill, said:

"On the question of what amounts to insanity that would prevent a person being punishable or not, I have read every definition which I could meet with, and never was satisfied with one of them, and have endeavored in vain to make one satisfactory to myself. I verily believe that it is not in human power to do it. You must take it that *in every individual case you must look at the circumstances* and do the best you can to say whether it was the disease of the mind which was the cause of the crime, or the party's criminal will." He also said: "*But we cannot fail to see that there are cases where the person is clearly not responsible, and yet knew right from wrong.*"

He then goes on to give the case of a woman he tried who had killed one child and was going to kill another, but who fortunately dropped the second child and went to a neighbor, telling her what she had done. This woman clearly knew the difference between right and wrong, and knew the character of the act, and, on the definition in the McNaughton case, in 1843, was guilty. Lord Justice Blackburn, however, as the woman was a raving maniac, so charged the jury on the ground of exceptional cases, that the jury found her "not guilty, on the ground of insanity," and rightly.

The Lord Chief Justice of England, in his criticism of Sir Fitzjames Stephens's plan of codifying the law of insanity, said:

> As the law, as expounded by the judges in the House of Lords, now stands, it is only when mental disease produces incapacity to distinguish between right and wrong that immunity from the penal consequences of crime is admitted. The present bill introduces a new element, the absence of the power of self-control. I concur most heartily in the proposed alterations of the law, *having been always strongly of opinion that, as the pathology of insanity abundantly establishes, there are forms of mental disease in which, though the patient is quite aware he is about to do wrong, the will becomes overpowered by the force of irresistible impulse; the power of self-control, when destroyed or suspended by mental disease, becomes, I think, an essential element of responsibility.*

The Lord Chief Justice of England, in his weighty and truly scientific opinion, the intrinsic weight of which is immense, deserves the admiration of both the medical and legal profession all over the world. Lord Moncrief, the Lord Justice Clerk of Scotland, has said from the bench that, "*in point of fact, there are very few lunatics who do not know right from wrong*," an opinion which I have myself insisted on before the New York Medico-legal Society, in two different papers read there. If we have *the absence of self-control produced by disease of the body affecting the mind*, in any given case of homicide on trial, it seems to me that every physician and every fair-minded lawyer will concur in acknowledging that we have here a philosophic or

scientific principle on which to found the plea of "not guilty, on the ground of insanity," and one which includes the cases of all insane criminals. It does not seem to me that, in the question of what constitutes insanity, the members of the two great professions of law and medicine should, or at all need to, entertain essentially different and irreconcilable views, or that on the question of the irresponsibility of criminals who are supposed to be insane, there should be such a diversity of opinion as exists to-day. The physician naturally studies the whole history of his patient and his ancestry, and searches for the causes of any bodily and mental changes that he finds, and thus arrives at the true pathology of the disease, while the lawyer and jurist are mainly interested in the *existence* of mental disease, its *degree*, and its *influence on conduct.* We know far more about insanity than they did in the last generation, and it is obviously unfair that laws pertaining to insanity when the knowledge of that disease was comparatively in its infancy should not be amended to keep pace with our increased knowledge of the pathology of mental disease. In that form of homicidal monomania where the patient is possessed of a sudden, blind, motiveless, unreasoning impulse to kill, I do not think that there is any desire, motive, or reasoning intention to commit such a deed, the true pathology of this form of insanity consisting, it seems to me, in a *vis a tergo* received from the diseased action of the brain. We have here *a diseased state of mind with absence of self-control.* We have in suicidal monomania also a *vis a tergo* received from the diseased action of the brain, in which, while our patient perhaps exhibits no other mental derangement, with no delusion or other intellectual disorder, has the blind, motiveless, unreasoning impulse to suicide, which, alike with the homicidal impulse, is the joint result of undoubted insanity. In both these cases the impulse is long, enduring, and gives rise to actions of patient deliberation and of cunning contrivance. The physician and the legal profession are willing alike to recognize disease in the suicidal act; why, then, the apparent unwillingness to recognize disease in the homicidal act? We must not look at these questions socially or ethically, but by the aid of the light of modern pathology, as the Lord Chief Justice of England has done already. No honest, scientific conclusion, however great an advance it may be upon existing views, is a dangerous innovation. There is a very false idea in the minds of well-educated persons, which I desire here to correct, that the skilled opinions of the medical witness,—the result of years of reflec-

tion and experience in his particular specialty,—that the perceptions of truth of the medical expert are obscured by the fact of his receiving a fair compensation for his services. The medical expert is called upon by the lawyer, who lays before him the evidence to be produced, and asks him for his opinion respecting it. The physician informs him either that, if he can prove the facts as he states them, he has a good case, and expresses his willingness to testify to that effect, or he tells him that the facts of the case *do not* justify the construction which the lawyer desires to put upon them, and declines to testify in the case.

The testimony of an honest medical expert is never wholly and unconditionally in favor of one side only, *unless such a result be warranted by the facts.* His judgment is *not* warped by the fact of his receiving compensation. If a lawyer comes to the physician and, by an exaggerated statement of facts, enlists the physician's aid as a medical witness, he will find that, if upon an examination of the case the facts do not appear as represented to the physician, the latter, if a scientific man, will either modify or entirely abandon his first conclusion, and decline to testify in the suit.

The frequency of epilepsy, and its injurious effect on the mind, makes its medico-legal relations a subject of great importance, and I have elsewhere pointed out that epileptics are to be classed in the most homicidal group of all the insane.

The late Dr. Ray, of Philadelphia (one of the most eminent of American experts, and one of the most brilliant and scientific men of the profession, a man who had devoted himself to the study of mental pathology for years, and who in his writings always displayed thorough observation and original thought, and to whom, in his contributions to mental pathology, his friends can fitly apply the words of Sartor Resartus: "Beautiful it is to understand and know that a *thought* did never yet die, that as thou, the originator thereof, hast gathered it and created it from the whole *past*, so thou wilt transmit it to the whole *future*"), speaks as follows respecting epilepsy:

The excessive susceptibility of epileptics to nervous impressions, which become distorted if not utterly changed on their way to the sensorium, is a phenomenon not clearly recognized by the profession at large, although it cannot have failed to meet the attention of the closer observer. In medico-legal inquiries, it should never be ignored or forgotten, for it may be the very phase of mental disturbance which prompted the criminal act. In view of what we already know of epilepsy, and of what still remains to be learned, we have a right to require the utmost circumspection and closest investigation whenever

the legal liabilites of epileptics are in question. The fact of its existence being established, is it going too far to say that legal responsibility is presumptively annulled, and that the burden of proof lies on the party that alleges the contrary? People are scarcely ready for it yet, perhaps, but to that complexion must they come at last.

Esquirol says that out of 339 female epileptics treated in Charenton, only sixty exhibited no aberration of intelligence. An epileptic convulsion may not occur, but may be represented by sadness, dejection, by sullenness, by ebullitions of rage and ferocity,—a *mania transitoria*, signalized by suicide, homicide, and every modification of blind and destructive impulse. Trousseau, the great French physician, has said that, wherever there was a revolting or motiveless crime, he suspected the existence of epilepsy; and the late case of Laros, of Pennsylvania, who poisoned his whole family, is an example of just such cases. The awakening from epileptic stupor may often resolve itself into an outburst of mental derangement, manifested by extreme vehemence, violence and destructiveness.

I have also stated that puerperal women and women at the climacteric period are subject at times to dangerous delusions, and also that kleptomania is a peculiarity of a certain number of cases of general paralysis. These facts are classical, and should be so accepted by the legal profession. One of the last cases of general paralysis under my care, was that of a gentleman of prominence and wealth, who would slyly secrete articles of absolutely no value to himself, and carry them home, and who, after being placed under my care, manifested this peculiarity for many months, so that his nurse would every few days have quite a collection of small articles to gather up and return to their appropriate places. I have observed this in cases of the ordinary type with grand delirium, and also in the senile form, characterized by progressive enfeeblement of the intellect and of long duration. It is a very interesting question in mental pathology, whether we are entitled to hold, in general paralysis of the insane, that the resumption of apparently healthy mental action, which we see in the remissions that sometimes occur, is compatible and coexistent with persistent structural degeneration? In other forms of mental disease also, after a mental darkness created and maintained for years by the presence of brain wasting, hypertrophy or consolidation of brain-tissue, with what cerebral condition can we identify these sudden flashes of restored intellectual light? In a paper on "Mental Responsibility and the Diagnosis of Insanity in Criminal Cases," read before the New York Medico-Legal Society, and

subsequently published in the London *Journal of Psychological Medicine and Mental Pathology*, I suggested a series of eight questions, which, it seems to me, if adopted by jurists in criminal cases, would form a most efficient and just test in any given case. Perhaps the legal profession may prefer the simpler proposition, which, as the result of Sir Fitzjames Stephens's attempt to codify the common law of England on insanity, may be briefly summed up as follows, viz.: *Homicide is not criminal, if the person by whom it is committed is, at the time when he commits it, prevented by any disease affecting his mind from controlling his own conduct.* This is very simple and very comprehensive, and therefore the legal profession may very properly prefer it to my own. The eight questions which I proposed in my paper are as follows, viz.:

1st. Have the prisoner's volitions, impulses or acts been determined or influenced at all by insanity, and are his mental functions—thought, feeling, and action—so deranged, either together or separately, as to incapacitate him for the relations of life?

2d. Does the prisoner come of a stock whose nervous constitution has been vitiated by some defect or ailment calculated to impair its efficiency or derange its operations?

3d. Has the prisoner been noticed to display mental infirmities or peculiarities which are due either to hereditary transmission or present mental derangement?

4th. Has the prisoner the ability to control mental action, or has he not sufficient mental power to control the sudden impulses of his disordered mind, and does he act under the blind influence of evil impulses, which he can neither regulate nor control?

5th. Has the act been influenced *at all* by hereditary taint, which has become intensified, so that the morbid element has become quickened into overpowering activity, and so that the moral senses have been overborne by the superior force derived from disease?

6th. Was the act effected by, or the product of, insane delusions?

7th. Was the act performed without adequate incentive or motive?

8th. Does the prisoner manifest excitement or depression; moody, difficult temper; extraordinary proneness to jealousy and suspicion; a habit of unreasonably disregarding ordinary ways, customs, and observances; an habitual extravagance of thought and feeling; an inability to appreciate nice moral distinctions; and, finally, does he give way to gusts of passion and reckless indulgence of appetite?

Some, or all, of these are found generally in connection with transmitted mental infirmity. It may be argued that these mental defects signify not mental unsoundness, but human imperfection. Certainly, if we take the manifestations in No. 8,—any one of them, singly and alone,—we cannot claim such a one as invariably an indication of insanity; but, on the other hand, under certain circumstances, each one of them may be an unmistakable sign of insanity, or rather of a morbid cerebral state which may readily lapse into insanity. The disappointments and calamities of life obviously act with greater effect upon an unstable mental organism; these causes of disturb-

ance meeting with a powerful co-operating cause in the constitutional predisposition. Sometimes a crime, even when there have been no previous symptoms to indicate disease, marks the period when an insane tendency has passed into actual insanity,—when a weak organ has given way under the strain put upon it. It is an important point in mental pathology to recognize the fact, rendered classical by antiquity,—Celsus, who practiced during the reign of Tiberius, and who wrote eight books on medicine, having clearly expressed this law of morbid sympathies and idiosyncrasies,—that it is the diseased or weak organ that retains all too strong impressions that affect the economy, and which becomes the centre with which are connected all the sensations and all the disorders communicated to the body. The laws of hereditary transmission operate very often in the development, in successive generations of the same family, of an unstable mental organism, too delicate to stand the wear and tear and haste of modern civilization, and such persons also often exhibit a true congenital deprivation of the normal intellectual faculties. There is a class of persons, with a peculiar nervous temperament, who inhabit the border land between crime and insanity, one portion of which exhibit some insanity, but more of vice; and the other portion of which exhibit some vice, but a preponderance of insanity, and it is very difficult to form a just estimate of the moral responsibility of such persons, especially when we reflect upon the fact that moral feeling is a function of organization, and is as essentially dependent upon the integrity of that part of the nervous system which ministers to its manifestations, as in any other display of mental function. I have met with cases in which, as a result of parental insanity, there has been a seemingly complete absence of moral sense and feeling in the offspring, and this has been a true congenital deprivation, or a moral imbecility, so to speak; of course, such children can hardly fail to become criminals. In this connection, it is interesting to note that moral degeneration often follows as a sequence upon disease or injury to the brain. A severe attack of insanity sometimes produces the same effect, the intellectual faculties remaining as acute as ever, while the moral sense becomes obliterated. It is an important medico-legal point relating to psychological medicine, that not every improvement is the commencement of convalescence, nor is the appearance of a few healthy traits an unquestionable presage of recovery. It is not rare to find a complete remission, consisting in the temporary disappearance of every sign of mental disease during the first

month of an attack of insanity, followed by a renewed intensity of the disease.

This, of course, is no more a recovery from disease of the brain than the remission in malarial fever is indicative of recovery from malarial fever. I have repeatedly witnessed such remissions, even in incurable organic diseases of the brain. We cannot explain these cases, but that they occur is perfectly well known to every specialist in diseases of the nervous system, as well as to most observant physicians. It should be borne in mind, therefore, that there may be a condition of mind resembling recovery, but where there is a latent irritability of the brain ready to break out in active insanity were not such persons prevented from assuming the cares, anxieties, and responsibilities of life for themselves. Unreasonable and uncontrollable restlessness and excitement or depression generally characterizes these apparent recoveries, and also very often a peculiar bitterness towards the institution where they have been treated with all gentleness and skill; whereas, in genuine recoveries, it is the rule to find patients entertaining the most lively gratitude to their physician and toward the institution in which they were treated. Dr. Pliny Earle, of Northampton, Massachusetts, one of the most eminent American alienists, the late Dr. Ray, of Philadelphia, and the most eminent English alienists have all expressed themselves unanimously on this point.

PART II.

INTRODUCTORY CHAPTER.

MODERN NERVOUS DISEASE.

OBSERVANT physicians know that neurotic affections are increasing and multiplying. We have to-day, as Americans, a morbid nervousness which I consider to be an entirely new state of the system, developing itself in modern society and making itself manifest by neuralgia, sick headache, dyspepsia, hay-fever, and neurasthenia or nervous exhaustion. This unprecedented nervousness, when it does not pass into actual disease, is also indicated by an increased sensitiveness to heat and cold, and a greatly augmented susceptibility to the action of stimulants and narcotics. Fat persons are less numerous and thin persons more numerous in the well-fed classes of society than was formerly the case. The increasing nervousness of this country is most clearly evinced by the connection with and influence of the nervous system on other diseases not properly nervous. Thus, in diabetes, the nervous system is in intimate relation with the disease; and I consider that it is often induced by mental anxiety and distress, or by sudden fear and shock. It seems to me to be advancing, *pari passu*, with the increase of nervous diseases. It is a disease decidedly more common than it used to be, and I attribute its greater prevalence to our present state of civilization. Bright's disease of the kidneys, nephritis and granular kidney, are also caused and aggravated by mental worry and anxiety. Heart diseases are also increasing steadily, particularly those of neurotic origin and nature. Rheumatism and gout, in both of which there is a nervous element, are more severe than they were years ago. Life, even though it be not shortened, is often made miserable by so-called mild nervous disorders, such as hysteria, herpes zoster, writer's cramp, and sick headache.

Premature baldness and early decay of the teeth are both far more frequent than they used to be, while our leading druggists can

bear witness to the truth of my statements by testifying as to the greatly increased consumption of neurotic remedies, such as morphia, hyoscyamus, conium, chloral, the bromides, arsenic, strychnia, and gelseminum. The consumption of tea, coffee, and tobacco is largely on the increase; the two former neurotic beverages and the latter a great nerve sedative. The neurotic circle in society as well as the distinctly insane circle of society, is increasing out of proportion to the increase of population.*

The causes of all this nervousness are due, first, to the increasing complexity of the nervous system; and secondly, to the increased complexity of life. The brain, I consider, is increasing in size in the American people, and this affects its functional activity immensely. Even though its size may not be increased, there is a great elaboration in structure and in the way of a finer architecture of our brains, new phases of intelligence, and new proclivities to nervous disease. Our brains are finer in structure and more subtle in mechanism, but instability is the result. The conditions of modern life which act on our complex and excitable nervous systems cause our increased nervous disease and even mental disease itself. Modern systems of education are also influential in promoting nervousness and in contributing to the increase of mental and nervous diseases. The general tendency of modern education on the young is to increase the activity and susceptibility of the nervous system by modifying the nutrition of the brain centres and stimulating their growth, and in fragile, sickly or badly nourished children, inducing brain exhaustion and organic disease. There is a great increase in habitual headaches, which I attribute to the exhausting effects of excessive and ill-directed brainwork in our modern schools. There are serious dangers lurking in our present teaching processes. I have traced sleeplessness, night terrors, somnambulism, epilepsy, hydrocephalus, hallucinations and other troubles to educational pressure unwisely applied to delicate children.

The great trouble is to make persons understand that brain tissue degenerations and mental diseases may be separated by long intervals of time from the too premature and intense stimulation of the brain which cause these nervous diseases. Hydrocephalus, however, is a nervous disease which shows itself at once from overstimulation

* The whole subject of modern nervous diseases was first systematically studied by Dr. J. Crichton Browne of England, to whom the profession are indebted as being the pioneer in this interesting field of research, and we have drawn largely on his writings.

of the brain in the young, and of late years the increase in deaths from this disease has not been among infants, but among children and young people from five to twenty years of age, in the educational period of life. This is a very significant fact. More remotely, as a cause of overstimulating the brain by education, we meet with the preponderance of nervous diseases in the refined and educated classes. If by premature and stimulating processes of education we force an elaboration of cerebral structure, hastening the functional activity of the brain, with no due regard to the law of evolutional precedence—which nature observes in her elaboration of the brain in infancy, childhood and adult age respectively—we upset the whole equilibrium of the brain, and serious nervous disease will necessarily follow. Growth must precede function, and if, while the child is so young or delicate that functional activity is still feeble, we apply undue exercise or stimulation, the brain will never be brought to the highest development of which it is capable. The cerebral centres, if never properly exercised, never develop correctly; but if we overexercise or overstrain the brain centres at their nascent period, we dwarf and weaken them, disturbing the balance of mind by seriously interfering with the natural sequence of the evolution of the brain centres. The functional activity of the brain is established at different epochs and perfected at different rates. By cautious stimulation of the brain we bring it to its highest development. By undue haste we ruin its functional activity forever, and can never have a sound and vigorous brain. The whole future complexion of mental life is, in a great part, determined by the impressions made on the sensory centres of the brain when they are undergoing development. We must aim in our system of education at a harmonious development of body, brain and mind alike, and we shall then attain progress, with health combined. We must resist the inroads of nervous and mental disease by a due attention to the regulation of the emotional elements, by disciplining the natural forces of character, and by placing before ourselves high ideals. We must remember to work wisely, without haste as well as with proper rest, in our different vocations of life. Sleep is essential to mental health, as during sleep our brain-cells derive their nutritive renovation almost entirely, and brain-workers need much sleep. Meals, to be digested, must be eaten slowly, not hastily, for we are rapidly becoming a nation of dyspeptics from too rapid eating, and vertigo and giddiness are often due to temporary derangement of the digestive organs. We may enjoy

constitutional vigor and a well-balanced development of parts, or by carelessness and neglect we may suffer from a constitutional debility and an irregular development of parts.

To avoid the numerous modern nervous diseases, I would finally caution the educated and reading and thinking portion of society to be careful not to violate those laws, the observance of which is indispensable to the well-being of the brain. The two states of wakefulness and restlessness which often occur in men of overworked brains are to be promptly met by leaving one's business and getting away with complete change of scene for a month or more. The diet should be carefully regulated at the same time. An overworked business or professional man will in a month return home well and able to go on with his regular daily round of duty, when by neglect of this simple precaution the overtasked brain gives way and mental disease ensues.

Mental anxiety, by producing sleeplessness and unrefreshing sleep, quickly disturbs the normal balance of the nervous system and deranges its functions. Appetite is lost, digestion is impaired, and the patient complains of pain, fulness and flatulence after eating. The pain may be of a severe neuralgic type, causing gastrodynia. The patient becomes emaciated and feeble. Mental anxiety also predisposes the patient to attacks of disease in various organs, both abdominal and thoracic, of a functional nature. The urine becomes acid and deposits a sediment of the lithates as it cools. The kidneys and bladder are irritated by this acid urine and pain and frequent desire to pass water is the result. There is generally in cases of nervous exhaustion from mental anxiety, constipation, diarrhœa and anæmia. We may also have epileptiform convulsions complicating the case. Our patient is now excessively nervous and liable to sudden shock or terror from comparatively slight exciting causes, and such a shock is a very frequent cause of the epilepsy I have spoken of. These sudden and violent mental emotions are very troublesome symptoms to contend with, but they disappear as we build up the nervous system of our patient. The epilepsy arising from mental shock commences quickly after the occurrence of the shock, as might be expected; while the cases of epilepsy that are the result of continued mental anxiety are preceded by terrible dreams, visions, startings or screaming out in the night. I think it possible that a good many cases of incurable epilepsy are caused by mental influences, and in our treatment we must carefully guard against

every influence which can endanger a return or a continuance of the disease. The state of mental health of an infant depends very much upon the mental state of the mother while she is nursing, and too great care cannot be paid by the family practitioner to this point.

Respecting syphilitic nervous disease, which is increasing, Dr. J. Dreschfeld, Lecturer on Pathology, Owen's College, Assistant Physician, Manchester Royal Infirmary, says:

Amongst the affections of the nervous system, those due to syphilitic lesions are certainly the most interesting, as well from a clinical as from a therapeutic point of view; for while on the one hand the lesions occurring in the different parts of the nervous system give rise to the most varied symptoms, an anti-syphilitic treatment, on the other hand, is in most cases, especially where the specific lesion has not in its turn caused irreparable secondary degenerations in the nervous substance, followed by the happiest results. Though the more exact study of these diseases dates not many years back, the number of well-observed cases on record has already reached several hundreds; a perusal of the different treatises, such as those of Hughlings Jackson, Buzzard, Broadbent, Wilks, and others, will, however, show that many cases, before they came under these observers, had been allowed to run on for a long time without being recognized, and without any specific treatment being attempted; one chief reason, perhaps, being the now well-established fact, that where the syphilitic poison selects as habitat the nervous system, we have often few, if any, secondary symptoms. As a small contribution, therefore, to this very important and highly interesting chapter, I beg to give an account of several cases observed by me, which particularly illustrate the varying of the symptoms according to the seat of the lesion.

Case I.—Emma H., aged 28, single, domestic servant, was sent to the Infirmary as an urgent case of brain fever, and admitted under my care (in the absence of Dr. W. Roberts) on April, 22, 1874. I saw the patient on the morning following. Without being comatose, the patient was apathetic and taciturn, complaining only of great pain at the back of the head. From her mistress, who had accompanied her to the hospital, we gathered that she had complained for a fortnight of great pain in the head; this was accompanied by a weakness in her right arm and leg, which increased to such an extent that she was obliged to take to her bed four days before admission; the day before admission the headache got much worse, vomiting came on, and she felt so prostrate that the family medical adviser sent her to the hospital.

The patient is of middle height, dark-complexioned, and of sallow hue; her skin hot and perspiring freely; temp. 101.5°, pulse 110, resp. 24 per minute. No nodes on any part of head or body; no rash or cicatrices on the body; the pupils a little dilated, equal and reacting to light; hearing good; speech has nasal character, as if some defect in palate; no paralysis of the oculo-motor muscles; no facial paralysis; tongue put out straight, moist, covered with a thin fur. Bowels had acted several times during the night (patient had received a saline mixture on admission). Urine high-colored, sp. gr. 1022, no albumen, abundant phosphatic deposit. Physical examination of chest and abdomen reveals nothing abnormal. Spine not tender on pressure; the right arm and right leg completely paralyzed. No wasting of right side. Sensibility on right side intact, likewise electro-contractility and electro-sensibility and sensibility to pain and to temperature. The left arm and leg in no way affected. Total loss of appetite; great thirst.

The age of the patient, and the hemiplegia preceding the purely inflammatory symptoms of the meninges, made me at once suspect a specific cause, and I prescribed 10 grs. of pot. iod. pro dos., together with cold applications to head.

April 23. Evening. Patient in about the same condition. Pulse 112, temp. 100.8°.

April 24. Morning. Patient passed a very bad night. She had been very restless, tossing about in bed, and delirious; complains of most violent pains in the head; pulse 100, temp. 101°. Mr. Windsor kindly examined the eyes, and found the fundus normal. On examining the throat, the soft palate is found to be altogether absent, likewise the right tonsil. The pot. iod. was increased to 20 grs. pro dos., pil. Plummeri (gr. v.) one every two hours.

Evening. Patient worse; semi-comatose; passes fæces and urine involuntarily; twitchings of muscles of left side; pulse thin, 108; temp. 101.6°; resp. hurried and shallow. Treatment continued; mercurial inunction applied to both legs.

April 25. Patient considerably better; her features present a more cheerful aspect; has no recollection of what happened during the last twenty-four hours; pulse 100, tem. 99.6°. Is able to use her right arm and leg a little; pain in head less severe; complains of pain in throat; paralysis of the sphincter continues. Treatment continued; chlorate of potash gargle. Patient is now for the first time able to give her history. Has enjoyed good health till, twelve months ago, she suffered from headache, rash, and sore throat, the throat continuing to remain sore for several months; for the last two months suffered from pain in the head, which was worse at night; a fortnight ago began to lose power in right leg and arm, which increased till that side was rendered perfectly useless.

April 26. Improvement continues; temp. 98.6°, pulse 80; has now control over the sphincters.

The headache and hemiplegia from this time improved rapidly; she continued to take the pot. iod. and the mercury, and the induced current was applied to the right leg and arm. She was sent to the Convalescent Hospital on May 16, preserving as the only remains of her illness a slight dragging of right leg; she stopped for three weeks at the Convalescent Hospital; when she left, the dragging of right leg still persisted, and I have heard nothing further from her since.

There can be no doubt that we had to do here with a case of syphilitic meningitis; the case, however, is instructive in several respects. The syphilitic disease ran its course in a very short time, and within twelve months from the first appearance of the secondary symptoms we witnessed the destruction of the soft palate and the right tonsil, and the advent of the graver nervous lesions, which began with intense headache and right hemiplegia. As regards the nature and seat of lesion, it is more than probable (from the fact that the nervous troubles came on soon after the syphilitic infection, that the symptoms were ushered in by great headache, that the development and disappearance of the symptoms were very rapid, and that the other symptoms pointing to a gummatous tumor of the brain were absent) that we had here at first a diffuse inflammatory disease in a cranial bone of the left base, which, by its compression of the right motor tract, gave rise to the hemiplegia, and which, by its extension to the coverings of the brain, brought on the general meningitis. A peculiarity which is noticeable in this case is the relation of the pulse and temperature to the general symptoms, the temperature being much lower and the pulse showing besides a greater constancy than is found in simple meningitis. In a case somewhat similar, but much slighter, quoted by Poncet (*Annales de Dermatologie et de Syphilographie*, 4^me^ *année*, No. 3), the temperature ranged between 98° and 99.7°, and the pulse never exceeded 92. Should this be found constantly we should have another important aid in distinguishing syphilitic from simple meningitis. The paralysis of the sphincters marked the gravity of the case (in the lighter forms of cerebral syphilis con-

stipation and slight retention of urine are generally observed); for, as in all other nervous affections, they occur in syphilitic nervous diseases in the last stage, and out of twenty-five cases which I collected from different authors, where there was such a condition of things, sixteen terminated fatally.

If, for a moment, we consider the different aids we have in diagnosing the syphilitic nature of a nervous disease, we have the following:

1. Age of patient. The age of persons affected with syphilitic nervous disease ranges between 25 and 40; out of ninety-six cases collected by Braus, sixty were of patients between 20 and 40 years old; and the cases given by Broadbent, Buzzard, and others exhibit the same proportions.

2. A syphilitic history. We have here to bear in mind that it is often difficult, especially in women, to trace such a history; that often when the syphilitic virus selects for its locality the nervous system there are few, if any, secondary symptoms, while, on the other hand, nervous troubles coming on in a syphilitic patient may be simply due to a coincidence. On looking over many recorded cases I find that certain forms of syphilitic nervous disease are much oftener preceded by well-marked secondary symptoms than others; this, for instance, is true for syphilitic epilepsy and the more acute cases of meningitis which come on soon after infection.

3. Multiplicity of lesion. Nervous symptoms which can only be accounted for by the assumption of separate pathological products situated in different parts of the nervous system are almost always due to syphilis.

4. Absence of other causes. This applies particularly to the paralysis of the different cranial nerves and to sudden attacks of hemiplegia in young persons, in the absence of any cardiac or renal troubles.

5. Influence of anti-syphilitic treatment. In a great many cases, especially where the course of the nervous disease is acute, and where the patient has not previously undergone an anti-syphilitic treatment the effects of the iodide and the mercury are very marked. In the more chronic cases, however, where the syphilitic deposit has itself undergone degenerative changes, and has established secondary changes in the surrounding nerve-matter, the treatment will of necessity be of little avail.

Having diagnosed a nervous lesion to be syphilitic, it becomes then of some moment to determine the exact nature and seat of the affection. This, though important as regards the prognosis of the case, is of no great weight as regards the treatment. I hope, however, at a future period to refer to this point also.

The early manifestations of nervous syphilis are too much neglected, and we deem it of special importance to call attention to this class of neuroses. Dr. Charles Mauriac, of Paris, in his able work on this subject, has drawn some valuable conclusions, to which we would invite the general practitioner's study:

(1.) At a period very near in point of time to the primary infection, syphilis may invade the nervous centres.

(2.) The early cerebro-spinal syphiloses are those that develop during the virulent period of the disorder; that is, during the first two or three years after infection.

(3.) There are degrees in the precocity of cerebro-spinal syphiloses: Those of the first degree are those that make their appearance within the first twelve months; the second degree includes those that develop in the second and third year of the constitu-

tional malady. Statistics seem to show that those of the first are more frequent than those of the second, but these results are not extremely important.

(4.) Among the early visceral determinations of syphilis, the cerebro-spinal are incomparably the most frequent.

(5.) They are also the most dangerous. Their gravity is not at all in direct proportion to their diathetic age; those that occur during the first months of syphilis are as serious as those that appear in the latest stages.

(6.) All the forms, degrees, and phenomenal combinations that constitute the symptomatology and processes of these syphilitic determinations to the nervous axis are as well seen in the early cerebro-spinal syphiloses as in the later ones.

(7.) There are, nevertheless, some symptomatic formulæ that appear to predominate. The most frequent are those that consist in an attack of hemiplegia involving all one side of the body.

(8.) Among the attacks of hemiplegia those constituted by the symptoms of aphasia with right hemiplegia exceed in number all the others.

(9.) The paralytic forms are much more numerous than the convulsive or epileptic forms in precocious cerebral syphilis.

(10.) In the cerebro-spinal syphiloses, psychic disorders and incoordination of movement are never systematized as in insanity, general paralysis, and locomotor ataxia.

(11.) The absence of systematization in the cerebro-spinal syphiloses should be regarded as one of their chief characteristics. The only exception is aphasia with right hemiplegia.

(12.) Early determinations of syphilis to the spinal cord are much less frequent than those to the brain.

(13.) Circumscribed or diffuse hyperplastic suffusions, but rather circumscribed in the cortical layers of the brain and in the pia mater, syphilitic alteration of the Sylvian arteries and consecutive ischæmic softening, such are the lesions that appear to belong to precocious cerebral syphilis.

(14.) In some cases of early cerebral syphilis, followed by death, we find no lesion, but then we do not thoroughly understand the arterial syphilosis. It may be presumed that death was the result of a sudden anæmia, extinguishing at once the nuclei of innervation of the centres indispensable to life.

(15.) Only vague conjectures are possible as to the etiology of precocious cerebral syphilis. In the majority of cases the primary symptoms, as well as the subsequent cutaneous and mucous manifestations, were very mild.

(16.) The general progress of the constitutional disease is not modified by the appearance of precocious syphilitic accidents of the nerve centres. The other manifestations are produced before, after, or during the involvement of the nervous axis, without undergoing any change in their forms, their degrees, their progress, or their topography.

(17.) The precocity of cerebro-spinal syphiloses furnishes no particular indications as regards treatment. Whatever the age of the constitutional disease, the manifestations in the nervous centres demand the same specific treatment. The circumstances proper to the determination itself furnish the secondary indications relative to the choice, dose, and combinations of the two specific agents.*

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* We would also refer the student and general practitioner to the work on cerebral syphilis by Dr. Alfred Fournier, of Paris, published in 1879, by Masson. He says that cerebral troubles occur most often from three to eighteen years after the initial ulcer. He recommends early and energetic treatment, kept up with the original energy during he course, and continued for a long time after the disappearance of symptoms. He

CHAPTER XVIII.

GENERAL CONSIDERATIONS ON THE DEVELOPMENT OF THE NERVOUS SYSTEM BY EVOLUTION, AND ITS CONDITION IN HEALTH AND DISEASE, AND REMARKS ON THE REGIONAL DIAGNOSIS OF SPINAL CORD AND BRAIN LESIONS.

A DIFFERENTIATED nervous apparatus first shows itself, according to Mr. E. Wooten, in the ascidian mollusc. It consists of one ganglion, situated in the neighborhood of the mouth, in the mantle, and giving off cords which proceed to the sense and digestive organs, the muscular sac, and both orifices. Next in order come the ctenophora, in which, in the end farthest removed from the mouth, is the ctenocyst, a spherical vesicle. This is a sense organ, and rests on a ganglion giving off fibres. Next come the echinoidea, where there is a ganglionated cord surrounding the gullet and sending off five branches among the ambulacral spaces. The annulosa have a chain of ganglia running the whole length of the body and united by nervous cords. At one end, where the sense organs are situated, the last post-œsophageal ganglion gives off two cords, which pass, one on either side of the œsophagus, and enter each a pre-œsophageal ganglion—the cephalic—which ganglion is generally double. The highest members of the order of the annulosa—the insecta—have two cords passing backwards from the cephalic above the ventral ganglia, and giving off branches to them and the body walls. This is the most rudimentary form of the cerebro-spinal system. In the vertebrata we have a vertebral column.

The lancelet is the vertebrate with the simplest nervous system. The neural axis of the animal is a delicate tract of nucleated cells surrounded by a covering of pia mater. Fifty or sixty pairs of nerves are given off laterally. The lampreys and hogfishes have a

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used iodide of potassium and mercury, the latter preferably by inunctions, and advises *alternate medication*. As auxiliary means, cold douches are very valuable. The iodide he gives at first in a dose of 3 grammes per day, raising it finally to 6, 8, or even 10 grammes daily. Strict hygiene is to be observed. No venereal indulgence or brain-work. Fournier ranges the various symptoms of cerebral syphilis under the headings of: 1. The cephalic; 2. Congestive; 3. Convulsive or epileptic; 4. Aphasic; 5. Mental; and 6. Paralytic group.

higher nervous organization than the lancelet, as they have a cartilaginous cranium, and the spinal cord extends anteriorly. There is no bony spinal column. In the cod and the shark, the posterior fissure widens and the halves of the cord expand. Two lateral columns also project into the ventricle from the conjoined restiform and posterior pyramidal tracts.

We next get a cerebellum and crura cerebelli added. Primarily in the brain we have a medulla, a cerebellum, and one or two unimportant appendages. Relatively it is higher and more complex in fishes than in the higher vertebrates. The brain is, to all intents and purposes, the developed cephalic portion of the cord. Secondarily we have the optic lobes, which is the largest division in osseous fishes. Under the lobes are two sub-spherical bodies, separated by walls containing a cavity which is analogous to the third ventricle of the brain in man. This ventricle is prolonged downwards into the pedicle of the pituitary gland, and upward into that of the pineal gland. The brain of a crocodile is very small, not much larger than a human thumb, while the brain of a bird is larger, both laterally and vertically, but is composed principally of the optic lobes and the cerebellum. The brain of the dog and of other animals is larger anteriorly, and the cerebra have developed *pari passu* with the animal's degree of intelligence; and this rule is observed in the human race, the complexity of the brain being in direct relation to the degree of intelligence of the people.

Multiplication of ganglia, as for instance in the actinidæ, is always accompanied by a corresponding differentiation of ganglionic functions, some being devoted to sight, others to controlling muscular tissue, etc. The nervous system is always adapted to the general structure of the animal. The nervous system of the annulosa consists of the double chain of ganglia which I have described. The greatest number of these ganglia are post-œsophageal, representing the sympathetic of the higher animals. The pro-œsophageal ganglion, being situated on the superior surface of the digestive tube, is the direct homologue of the vertebrate brain. The insecta—which are the most important members of this order—exhibit, as I have said, the most rudimentary form of a cerebro-spinal axis. There is a prolongation of the substance of the cephalic ganglion backward in the form of two cords above and in contact with the non-cephalic ganglia. Functionally, these spinal fibres unite the ganglia and fibres into a mechanism capable of responding to the mandates of

any one ganglion, but more especially to the cephalic. If we cut an annulose animal, such as the garden-worm, for instance, into pieces, each piece will retain the power of movement for hours, provided that each piece has a perfect ganglion. The garden-worm has no spinal fibres. If I take an insect, such as a fly, and cut off its head, it can fly a little, can walk, can regain its footing if I put it on its back. But if I cut it in two, it dies,—why? Because while in the worm the separate pairs of ganglia formed an independent vital apparatus, in the fly they are *not* independent, but, through the fly's spinal fibres, interdependent. In the highest vertebrates, reflex movements may take place through the brain, spinal cord and sympathetic system. These govern the visceral functions and are connected with the voluntary actions of life. I have shown how the brain or cephalic ganglion is gradually increased in motor and sensory power and the non-cephalic ganglion relatively lessened, the nervous apparatus gradually gaining in complexity until man is reached, where we find the nervous system comprising the cerebrum and cerebellum, with the various ganglia and commissures which belong to these bodies, the medulla oblongata, the spinal cord, the sympathetic ganglia and the nerves, which springing from these several sources are distributed throughout the organism. In the insect the spinal cord is a centre of common sensation, and it acts by itself without the brain. It acts as a whole, and section causes death.

Another very interesting fact is that the fineness of the nerve-fibre in man is in direct relation to the dignity of its functions. The nerve-fibres in man, in the brain and spinal cord, measure from $\frac{1}{1000}$ to $\frac{1}{14000}$ of an inch in diameter, and in the trunks and branches of nerves they measure from $\frac{1}{2000}$ to $\frac{1}{3000}$ in. In the mammalia the average size of the nerve-fibres is from $\frac{1}{1625}$ of an inch in diameter to $\frac{1}{6500}$. In the frog $\frac{1}{1260}$ to $\frac{1}{2280}$, and in the eel $\frac{1}{1643}$ of an inch. Among the invertebrates the fibres are relatively fewer and coarser than in the vertebrates, and the fibres of the cephalic ganglion are finer than those of nerve branches. We can, therefore, judge pretty nearly about the relative powers of parts of any animal's nervous system by comparing the size of their fibres. We see, therefore, through all the members of the animal kingdom which possess a nervous system, a process of evolution or development gradually proceeding, with a gradual differentiation of nervous cords to separate fibres; that we have, primarily, multiplication of ganglia and, as the next step in evolution or development, the supremacy of a single

ganglion which becomes the cephalic ganglion, and that next this cephalic ganglion sends backwards two communicating cords, and we have a gradual elaboration of the cerebro-spinal axis. We should bear in mind that the qualities of the tissues of the highest vertebrates are the differentiated properties of the simpler protoplasmic cell. If we find but a single ganglion in an animal, we know that in it resides that animal's highest powers. If the ganglia are connected with sense organs, we know then that we have an animal with ganglia of special sense, presiding over sight, hearing, etc. As the cerebro-spinal axis elaborates, we have separate ganglia with distinct functions; the spinal cord differentiating in degree and receiving the power of reflex action, which increases with the multiplication of sympathetic ganglia, losing gradually its facilities of common sensation and volition, which become grouped in the cephalic ganglion or brain. The nervous system develops first in the development of a large complex cephalic ganglion and spinal cord; and secondarily, by the extension into the tissues of the body of offshoots from the spinal cord; and finally, as I have before remarked, as the intelligence increases, the fineness of the nervous-fibres increases.

General Considerations on the Diagnosis, Pathology and Treatment of Nervous Diseases.—There has been a great advance in the treatment of nervous diseases recently, attributable to increased knowledge, to the improved methods of medical teaching, to the closer attention paid to the anatomical investigations, and to more extended opportunities of medical research offered by the invention of the precise instruments for diagnosis, in which our age has been so prolific. The introduction of the ophthalmoscope has thrown a much desired light into a heretofore dark chamber of cerebral pathology, enabling the physician to infer from the condition of the retinal vessels, the existence of structural changes in the cerebral arteries calculated eventually to lead to the host of diseases which may threaten the integrity of the vital and intellectual functions, or prove fatal perhaps instantaneously. Although not an ultra advocate of the ophthalmoscope in the diagnosis of diseases of the brain and spinal cord, I think it is, in many instances, a most useful adjunct, and will briefly notice the cases in which, by its aid, we may make a more accurate diagnosis than would otherwise be possible. The great point of importance in the treatment of nervous diseases is, to be able to make an early and accurate diagnosis of the seat of the lesion in organic diseases of the brain and spinal cord. We want to know

what the disease is and *where* it is, and if we can relieve or cure it. We must be perfectly informed as to the physiological anatomy of the brain and spinal cord, and also as to its physiology. We must also thoroughly understand semeiology, to be experts in nervous pathology. We are beginning to be able to localize disease affecting only portions of the brain, very accurately. We can also diagnosticate lesions occupying one-half of the spinal cord, and can estimate accurately the height of a lesion in the cord. We can diagnose disease in the antero-lateral columns, the posterior columns, the anterior cornua, the centre of the cord, and in the nuclei of the medulla oblongata. We can determine the extent and exact distribution of descending degeneration in the spinal cord secondary to cerebral lesions. We can also diagnosticate the exact seat of disease of a mixed type, as, for instance, amyotrophic sclerosis, where there exists disease of the anterior matter of the cord combined with sclerosis of the antero-lateral column of the cord. We have been guided in our studies on the diseases of the spinal cord by embryological and microscopical researches as to the structure of the spinal cord.

Such researches have taught us, among other things, the law of variability as to the decussation of the motor tract just below the anterior pyramids of the medulla oblongata, which enables us to understand those cases in which a brain lesion on one side of the brain produces paralysis or spasm on the same side of the body, and also should teach us, not that there is *no* decussation of the motor tract, but that these cases are exceptional ones. For example, if a patient is brought to me in consultation, and he has chronic localized convulsions of one side or affecting perhaps but one limb, I should unhesitatingly say we had to deal with a cerebral tumor, in all probability, in the opposite motor zone. The ophthalmoscope in this case would very likely aid my diagnosis by revealing a neuro-retinitis or choked disk, and the patient would also probably complain of a fixed localized pain in the head, while percussion over the affected part of the brain would elicit pain. In locomotor ataxia or posterior spinal sclerosis, the ophthalmoscope reveals a papillary hyperæmia of the optic nerves ending in atrophy, although we *may* find posterior spinal sclerosis with no lesion in the optic nerve. In cerebral tumors, either in the cerebellum, the cerebral convolutions, or in the basal ganglia of the brain, we find by ophthalmoscopic observation, generally, a descending optic neuritis or a choked disk.

Basilar Meningitis.—The ophthalmoscope aids our diagnosis in that,

a choked disk or a neuro-retinitis with exudation, directs our attention to intracranial disease of some kind, and we must look to the other symptoms to help us locate the disease in the nervous system. *Generally*, grave lesions of the brain and spinal cord cause a propagation of the lesion to the eye, giving rise to neuritis or neuro-retinitis or choroiditis. The neuritis, when it occurs, may be either mechanical, depending on obstruction and arrest of meningeal circulation; a descending neuro-retinitis, which we find in acute and chronic encephalitis and in intracranial tumors; an ascending neuritis, ascending in the direction of the inflammatory process in the nerve-fibres of the spinal cord (*not* the ascending optic neuritis of the ophthalmologists, which means a neuritis starting from the ocular end of the optic nerve, ascending towards the brain); and finally, a constitutional neuro-retinitis or neuro-choroiditis, found in syphilis of the brain and cord. We must bear in mind that grave cerebral or spinal disorder *may* exist with no apparent ophthalmoscopic sign being present. The presence of amblyopia and amaurosis, choked disk and optic neuro-retinitis, may support a diagnosis of cerebellar disease, but we should also find the positive symptoms of disturbances of co-ordination, especially the reeling gait with severe vertigo, and even then, as we find these symptoms in other nervous disorders, they are not perfectly pathognomonic of cerebellar disease.

Disease of the anterior pair of the tubercular quadrigemina is generally accompanied by disease of visual power or blindness. Although optic neuritis may be wanting in large tumors of the brain, we may find it with very small neoplasms, if they are complicated with hydrocephalus of an extensive character. The hydrocephalus produces optic neuritis by the cerebral œdema it excites. If we find an œdematous optic neuritis, we are justified in diagnosticating the existence of hydrocephalus and cerebral œdema. Retinal ischæmia and chronic spasm of the iris would seem to bear a pretty definite relation to epilepsy, although more positive results are hoped for in the future from more extended investigations on this point. Injuries to the head have also been followed by a choked disk, indicative of grave cerebral trouble. Finally, by the aid of the ophthalmoscope, we may be much assisted in making an early and accurate diagnosis of diseases of the brain and spinal cord.*

* In chorea, reports have been made of embolism of the central artery of the retina. We see optic neuritis in cases of convulsions from organic brain-disease. We find atrophy of the optic nerve in paralytic dementia. Optic nerve atrophy is also seen in the early

Cerebral Localization.—Respecting the very interesting subject of cerebral localization, it is regarded as settled that the *ascending parietal convolution* is the cortical motor centre, in its innermost and superior part, of the upper and lower limbs; in its middle, for the forearm and hand; and in its external or inferior part, of the facial muscles. The *ascending frontal convolution* is the cortical motor centre, in its most external or inferior part—where the third frontal has its origin—of the lips and tongue, the movements of which are destined for the pronunciation of words, and we generally find a perfect parallelism between the intensity of the lesion of movements and the gravity of the lesion in the cortical motor zone. There is *generally* a perfect accord between the cortical lesion and the peripheral and functional lesion, so that, for instance, in a case of localized convulsions, we may, with certainty, *from the region of the body where the convulsive movements commence, diagnosticate the cortical centre primitively and principally affected, which will be that corresponding to the group of muscles earliest brought into action.*

We know, absolutely, that in a case of verbal paralysis we have a lesion of the most inferior part of the ascending frontal convolution and of the foot of the third frontal, in which cortical centres " the transformation of ideas and verbal images into motor impulses toward the muscles destined for their extrinsication takes place."

Respecting the cerebral ganglia, we know that the corpora quadrigemina serve as nervous centres for the perception of light, and

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stages of locomotor ataxia in some cases, also in disseminated sclerosis. If a traumatic meningitis occurs after an injury to the head, we may have an optic neuritis, or it may occur after some time, as the result of inflammation. A meningitis of the convexity would not probably reveal any eye lesions.

As the retinal circulation is regulated in a special manner by the intra-ocular tension, the student must not expect to find anæmia and hyperæmia of the brain, always showing itself by a corresponding change in the retinal circulation. Congestion of the optic papillæ will generally follow, however, very acute cerebral hyperæmia. Gowers has stated that in chronic encephalitis, we may see well-marked neuritis (papillitis). My friend, Dr. H. Knapp, the eminent ophthalmologist, recently sent me a case in which retinal hæmorrhage preceded for a short time, a fatal cerebral hæmorrhage. The blood state was bad, the patient being addicted to alcohol. Gowers states that we may in rare cases see retinal embolism in softening from embolism; also, that in softening from arterial thrombosis, when this is due to atheroma, associated changes, hæmorrhages or renal retinitis, may be found in the retina. In cerebral abscess, we may find an optic neuritis, also in most cases of brain tumor. In opium habitués, I have seen optic nerve atrophy and also congestion in inebriates. Care must be taken not to confound physiological variations with pathological changes. In diseases of the nervous system, science would be much advanced if physicians would examine and report all intra-ocular changes.

that a reflex action takes place through them by which the amount of light admitted to the eye is regulated to accommodate the sensibility of the pupil. The optic thalami receive, preserve, and transform the sensorial impressions previous to their definite irradiation to the cortical periphery.

The corpora striata are the centre for the reception, regulation, and elaboration of voluntary motor impressions emanating from the deep layers of the cortical matter, whose large cells originate them.

With regard to therapeutical appliances, a complete revolution has been wrought in the treatment of cerebral disease by the guidance of the scientific principles and instruments I have spoken of. Every neurologist will admit that, in many respects, however, the pathology of cerebral disease is still involved in great obscurity, although modern physiological research and clinical experience have done much to remove many difficulties from our path. We may have many serious cerebral diseases existing, and even reaching a fatal termination, without giving any appreciable note of warning and unaccompanied by any pathological symptoms during life; and, on the other hand, we may have apparently slight cerebral derangement producing serious and alarming symptoms.

The exact seat of cerebral disease is indicated more or less clearly according to its more or less intimate connection with the nervous fibres which control or direct the communications between the cerebral mass and those external objects with which our bodies are placed in relation. In a general way, we may say that the posterior columns of the spinal cord, passing through the medulla oblongata, through the pons varolii, then through the ganglia called the optic thalami and the corpora striata, are connected with the sensitive branches of the fifth pair of nerves; while the anterior columns, pursuing a similar course, are connected with the motor branches of the fifth pair, and also with the third pair, the fourth pair, the sixth pair, and the portio dura of the seventh pair and the ninth pair, all of which are exclusively endowed with motor powers. As we trace the nervous fibres of the brain *downwards* we find them successively passing through the corpora striata, the pons varolii, and then crossing or decussating in the medulla oblongata, so that the fibres from the right side of the brain pass, for the most part, to the left side of the cord and *vice versa*. The explanation is thus afforded of the fact that paralysis on one side of the body *almost always* denotes some disease on the opposite side of the brain, and it is also easy of compre-

hension that, when the central part of the motor or sensitive tract is affected, the paralysis will be on both sides. It is a fact not so generally known that, when the seat of the disease is in that part of the brain which is not immediately in the tract of the motor or sensory nerves, there may be no paralysis at all, although the lesion may be very serious and extensive. The great bulk of the hemispheres are, so to speak, expansions or outgrowths from the divergent fibres of the spinal cord, and are, as it were, outside the motor and sensory tracts, or are only blended with them in a loose and general connection. I know of a case where there was, in the right posterior lobe of the brain, very near the surface, a large cavity—as large as a hen's egg—filled with an apoplectic clot, where, during life, there was no paralysis in any of the limbs and no anæsthesia, although the patient was carefully examined day by day for three weeks previous to death. The symptoms were sickness, vomiting, great pain in the head, the pupils contracted, bowels constipated, and great somnolence. The urine passed involuntarily. Nature was trying to effect a cure in this case, as a membrane was in process of formation on the circumference of the cavity, and the clot was beginning to assume a yellowish tint. The reason there was no paralysis was because the seat of the effusion was not in the tract of the ordinary motor and sensory nerves. The general location of the apoplectic effusion is in one of the lateral ventricles, affecting the corpora striata or the optic thalami.

There are many circumstances which give us reason to hope for good results from treatment in some cases of brain disease apparently of the most desperate nature. We may have symptoms indicating brain disease and the brain be perfectly healthy, or the brain may be affected functionally and secondarily, the real seat of the disease being situated elsewhere, and of a transient or curable nature.

I have seen many cases where convulsions, spasms, or coma existed while the brain was intact, and when, the local symptoms being removed, the brain symptoms disappeared entirely. I have seen apparent apoplexy depending on congestion of the kidneys and rapidly disappearing as such congestion was relieved. I have seen coma and convulsions vanish when an intestinal worm was expelled. I have seen cerebral congestion in women disappear as the menses appeared or reappeared, and many family physicians have seen spurious hydrocephalus disappear on the cutting of a tooth. But even if we have actual disease of the brain it does not follow at all that the case is incurable. Primary congestion of the brain is often

relieved by remedial dietetic and hygienic measures, and even after an apoplectic effusion has taken place nature, assisted by judicious treatment, may accomplish a cure. Nature can absorb effused blood, leaving a cyst, and the brain may be restored to its healthy state. Certainly an attack of apoplexy followed by paralysis is a very serious state of things, but life may be preserved and enjoyed for a great many years by judicious remedial measures and by keeping away all injurious influences from persons who have had an apoplectic attack. Such persons should be put on low diet, as a rule, and purgative medicines administered. I think there is nothing better than a drop of croton oil, followed by saline purgatives, with perhaps bleeding if the attack is recent, the patient plethoric, the pulse full, hard, and strong, and the breathing stertorous. In the most fortunate of these cases we shall find our patient much better, in full possession of his faculties, and with regained use of his limbs, and we get a complete cure. We may find hypochondriasis, hysteria, vertigo, wakefulness, or drowsiness all produced by a long-continued improper condition of the bowels, from imperfect action, or a torpid condition of the secreting and expelling structures of the large bowel.

If the descending colon does not work well we may have quite violent and persistent pains referred to the back, hips, or groins; also certain forms of sciatica and violent lumbar pains. I very often find that vertigo, swimming in the head, or giddiness is indicative merely of a deranged condition of the stomach and liver, or of disturbed heart-action, although vertigo may be due to serious brain disease. Persistent drowsiness is generally dependent upon some imperfect action of the digestive organs, and mild purgation generally relieves this troublesome symptom. The symptoms of wakefulness and restlessness, when your patient says he must be constantly changing his place or scene, and cannot get into a composed state, and cannot sleep, should, if it has lasted long, excite attention. Rest from business for a few weeks will, in an overworked man, perhaps ward off impending mental disease.

The physician who is interested in cerebral physiology will find it a matter of interest to institute experiments on the original temperature of the head under the different conditions of rest and intellectual activity. It will be found, as a uniform rule in such researches, that the evolution of heat is directly in proportion to the intensity of mental action, and that the anterior portion of the left side of the head will show the rise more frequently and to a greater extent than any

other region, both for intellectual and emotional states. The best instrument in use is a thermo-electric apparatus.

In localizing chronic lesions of the nerve-centres, the rules laid down by Professor Benedikt, of Germany, are very excellent, and I accordingly give them here:

1. The appearance of synchronous and symmetrical paraplegia points to disease of the anterior half of the spinal cord or its envelope. Only very exceptionally does a spinal paraplegia affecting the legs or arms arise from two hemiplegias. Paraplegia of the legs generally points to disease at the level of the lumbar enlargement; paraplegia of the arms, to an affection of the cervical enlargement. Paraplegia from disease of the vertebral column is characterized in its course by the primary preponderance of the symptoms of diseased vertebræ at the seat of the lesion, and is shown by the greater implication of the posterior roots and their long-continued irritation in *paraplegie douloureuse*.

2. Cerebral paraplegia clearly arises from two clearly-defined hemiplegias. Exceptions due to disease of the spinal cord are exceedingly rare.

3. Characteristic tabetic symptoms show disease of the posterior half of the spinal cord.

4. Progressive muscular atrophy shows disease of the gray substance of the cord in the neighborhood of the central canal, or, at any rate, diffused disease of the anterior roots and the accession of atrophy of the extremities to the number of spinal symptoms has the same significance.

5. Hemiplegia, with opposite hemianæsthesia, points to disease of one-half of the spinal cord. The hyperæsthesia, on the same side with the paralysis, arises probably from paralysis of the vaso-motor nerves on the affected side.

6. Bilateral tabetic neuralgia of the legs or arms, in central neuroses, shows disease of the posterior roots and their central prolongations.

7. Progressive paralysis of cerebral nerves points to a more or less diffuse disease of the region of the medulla oblongata containing their nuclei as far as the crura cerebri, or diffuse disease of the peripheral prolongations of these nuclei.

8. Paraplegia of the tongue (alalia) and its inception stage as well as difficulty of deglutition, signifies a disease at the level of the hypoglossal and glosso-pharyngeal nuclei.

9. Hemiplegia, with opposite facial or oculo-motorius paralysis, shows disease of the fibres of the pyramid at the level of the affected nuclei, especially of the points of exit of the affected nerves.

10. Hemiplegia, with hemianæsthesia of the same side, points to disease of the pyramid between that level in the medulla oblongata at which the decussation of the sensitive fibres is accomplished, and the entrance (inclusive) of the outer bundle from the foot of the crura cerebri into the medullary substance of the hemisphere behind the lenticular nucleus. Exclusive hemianæsthesia, or where that predominates over hemiplegia, points by preference to the latter spot.

11. Hemiplegia, with incomplete facial paralysis (the upper branch remaining free), shows disease of the central motor ganglia. The electrical examination, especially the discovery of crossed reflex action, is of signification for the localization of the paralysis within the crura cerebri (Gehirnstammes) and the central ganglia.

12. Hemiplegia, with convulsions, points to a lesion of the cerebral hemispheres central from the central ganglia. The more the convulsions become prominent the nearer is the locality to the convolutions. Complication with aphasia (the ability to understand

speech remaining), shows the locality of the lesion to be in the anterior lobe in the neighborhood of the island; complication with bilateral nemo-retinitis shows that it is above the optic thalamus. Many times the convulsions do not appear in disease of the hemispheres with hemiplegia, because, on one hand, with the occurrence of the lesion, *e. g.*, acute softening, hydrocephalus occurs and renders the irritation of the central ganglia impossible on account of pressure; or, again, the pathological change (*e. g.*, new growth), does not give rise to symptoms until it presses mechanically on the central ganglia.

13. The most essential symptom, in uncomplicated diseases of the meninges (Gehirnwände), is convulsions; and paralysis never occurs without previous convulsions.

Here Professor Benedikt enters upon the signification of single symptoms for localizing the lesion, and states that psychical disturbance, under all circumstances, points to primary or secondary disease of the convolutions of the brain:

Static vertigo (Statisches Schwindel, lateral progression) shows an affection of the cerebellum, although the entrance of the cerebellar fibres into the crura cerebri may be diseased.

Contractions of central origin may be of spinal or cerebral nature; the former are, usually bilateral, the latter unilateral; the former are, as a rule, limited to the extensors the latter to the flexors. Spinal contractions never occur without evidence of abnormal reflex irritability, and are both excited and increased by sensorial influences; cerebral contractions are likewise the product of sensorial irritation, since they generally cease during sleep, and are increased by every sensorial impression. But cold and heat have also influence over the contractions of cerebral origin. Hence, it may be said, contractions are probably not independent motor symptoms, but are caused by sensible and sensorial reflex action.

Trembling, caused by the rhythmical contraction of groups of antagonistic muscles, may be either of spinal or of cerebral origin. It is not identical with paralysis agitans, the latter being a morbid unit.

14. Trembling, as a symptom, cannot be referred to any special location of the lesion.

15. Influence of sensorial irritation upon a phenomenon due to motor irritation is no proof of location of lesion within the brain, considering that the morbid phenomena in locomotor ataxia are notoriously caused by disease of the sensitive part of the cord, and that choreic spasms depend on sensorial and probably also on increased spinal irritability; further, that convulsions symptomatic of brain disease are observed only in a condition of irritability of the hemispheres; it follows:

16. Phenomena of motor irritation from central cause are excited especially by the irritation or at least the co-operation of the sensitive and the sensorial fibres. But even when all the chasms in the localization of all symptoms, and of the groups of symptoms caused by foci of disease, are filled up, there still remains a large number of cases in which an attempt at exact localization must fail. This is owing to the fact that many forms of disease (*e. g.*, sclerosis, hæmorrhage, many new formations, etc.) have a tendency to become diffused. There is only the question whether there is reason to suspect a diffused process, and how it can be localized. The first question can be easily answered. There is reason to suspect a diffused process when the symptoms due to known and different localities are combined, and occur together. It is, then, evident that the concentration-law of Bell (A.) does not answer, and that another law, the diffusion-law of localization (B.) must be employed.

B. If a combination of symptoms and groups of symptoms with known and different localization of lesions is present, each must be referred by itself to its known locality. This rule is so simple it would seem needless to mention it, but the history of diffused sclerosis, of dementia paralytica, of chorea minor, etc., shows that even now it is but little regarded.

This translation, from the German of Professor Benedikt, is by the able pen of Dr. Winslow, of London, the editor of the *London Journal of Psychological Medicine and Mental Pathology*. Respecting the diagnosis of diseases of, or injuries to, the spinal cord, there are some excellent rules for localizing the lesion in the cord by Dr. C. E. Brown-Séquard, which I insert:

1st. A paralysis of voluntary movements, limited to one of the lateral halves of the body, shows that the lesion is in the corresponding half of the spinal cord.

2d. A paralysis of the muscular sense, in one only of the lateral halves of the body, shows also that the lesion is in the corresponding half of the spinal cord.

3d. A paralysis of the vaso-motor nerves chiefly evidenced by an elevation of temperature in one of the lateral halves of the body, equally shows that the lesion is in the corresponding half of the spinal cord.

4th. Hyperæsthesia—*i. e.*, an increased power of feeling and not pain—in one of the lateral halves of the body, clearly indicates also that the lesion is in the corresponding half of the spinal cord.

5th. The various ocular and facial symptoms which we know as effects of the paralysis of the cervical sympathetic nerve—*i. e.*, vascular dilatation, elevation of temperature, hyperæsthesia, partial closure of the eyelids, constriction of the pupil, etc.—in one of the lateral halves of the head and face, positively show also that the lesion is in the corresponding half of the spinal cord.

6th. Anæsthesia in one of the lateral halves of the body leaves no doubt that the lesion is in the opposite half of the spinal cord.

Two more propositions are given, relating also to cases in which it is known that an injury or a disease exists in the spinal cord:

1st. When a paralysis exists on both sides of the body, in a greater degree, however, in one than in the other, the lesion is in both sides of the spinal cord, but chiefly in the side corresponding to that of the greater degree of the paralysis.

2d. When a complete or very marked anæsthesia exists in one of the lateral halves of the body, with some diminution of sensibility, instead of hyperæsthesia, in the other half, the lesion exists chiefly in the lateral half of the spinal cord corresponding to the side of least anæsthesia, but it extends slightly to the other half of the spinal nervous centre.

These rules make it possible to make a very exact diagnosis as to the seat of lesion, in diseases of or injuries to the spinal cord, where the result is spinal hemiplegia. There are some points in the regional diagnosis of brain diseases producing paralysis which have been clearly delineated by Dr. Charlton Bastian, of London, which may properly

be spoken of at the end of this chapter. If we have large lesions in the central parts of the pons varolii, we find in our patient deep apoplectic symptoms, characterized by deep coma, complete paralysis of limbs on both sides, flapping of the cheeks during expiration, insensibility of conjunctiva, and very much contracted pupils. Death may take place in a few minutes, a few hours, or in a day or two. Where there is a speedily fatal result this occurs when the patient is in a state of collapse, with a temperature lower than normal, but where life is prolonged for a few hours the temperature steadily rises, till at the time of death it may have attained 109° or 110°, a condition of profound coma continuing all the time. From a slight lesion in the pons consciousness may be regained, but there remains a generalized paralysis, more or less equally distributed over the two sides of the body. Sensibility may be diminished or perverted, and in a lesion involving the central part of the pons varolii, we shall find well-marked but irregular paralysis about the face, involving eyelids, mouth and tongue, difficulty in deglutition, and well-marked difficulty in articulation.

If a lesion exists in the *lower half of one lateral region* of the pons varolii we get "alternate hemiplegia," in which we find a very well-marked facial paralysis on the side of the brain lesion, and a more or less complete motor and sensory paralysis of the limbs of the opposite side. Such a hemiplegia may set in with apoplectic symptoms, or there may be an epileptiform mode of onset; while in other cases it supervenes more gradually, without either loss of consciousness or convulsions. If the injury or disease is in the *upper part or half of one lateral region* we get the same kind of hemiplegia I have just spoken of, but with the well-marked paralysis of the face existing on the side opposite the brain lesion, or on the same side of the body as the paralysis; for here the fibres of the facial are implicated above their point of decussation in the pons, just as the motor channels for the limbs are implicated above their decussation in the medulla. The facial paralysis is so well-marked as to involve the orbicularis palpebrarum, and there are difficulties in deglutition and articulation whichever half of the lateral region is implicated. The impairment of sensibility is variable as the lesion approaches near to or actually involves the ventricular aspect of the pons, and where it exists *it is apt to be more marked and more durable* than in the great majority of cases of hemiplegia due to lesions further away from the base of the brain. Sometimes we have a limited unilateral hyper-

æsthesia instead of anæsthesia. There is apt to be marked emotional disturbance in these lesions of the pons, the patient having great tendency to laugh or cry. When lesions of the pons cause irritation of parts of the surface of the floor of the fourth ventricle, we may find sugar in the urine; polyuria or albuminuria if lower portions of the fourth ventricle are implicated. Slight lesions of the pons are frequently ushered in by an epileptiform attack without loss of consciousness or convulsions. Early rigidity is met with in lesion of the pons, and there may be rigidity of some of the muscles of the neck.

When lesions occur in the *crus cerebri*, the diagnosis may be easy or extremely difficult, depending upon the situation and extent of the lesion. If the *inner and inferior part* of the crus near the pons be injured, or if there should be a large lesion implicating this and contiguous parts of the crus, the third nerve on the same side becomes paralyzed, whilst a hemiplegic condition is also established in the opposite half of the body. If, on the contrary, the lesion implicates only *the upper and outer part* of the crus—the part next the cerebral hemisphere—the diagnosis is then very difficult, there being no distinctive sign of a lesion in this situation, and the grouping of symptoms approximates very closely to that met with in lesions of the optic thalamus. When the lesion is in the lower and inner part of the crus we get an "alternate paralysis," the third nerve being paralyzed on the side of the brain lesion, shown by ptosis or dropping of the eyelid on the same side, by dilatation and sluggishness of the pupil, by external squint causing double vision, and by its being impossible for the patient to move his eyeball except slightly further outwards owing to forced contraction of the external rectus, and a little around its own axis in one direction—from outwards, upwards; owing to forced contraction of the superior oblique muscle. All the muscles, then, of the eyeball are paralyzed, except the external rectus and the superior oblique, which are supplied by the sixth and fourth nerves respectively. The hemiplegia, on the opposite side of the body, is very like that produced by a lesion in the upper part of one lateral half of the pons varolii; the tongue generally deviating distinctly to the paralyzed side, and the facial paralysis about the mouth being well-marked. The articulation is often affected, or there may be only a slight thickness of speech for a short time. Deglutition may not be interfered with. Sensibility is generally much impaired on the paralyzed side, the impairment lasting some time, and being most marked in the limbs. The temperature

of the paralyzed side may be as much as two degrees higher than that of the non-paralyzed side.

The motor paralysis occasioned by lesions *in* or *about the optic thalamus*, are not so pronounced as that produced by lesion in or about the corpus striatum, and sometimes even may be entirely wanting. Early tonic and clonic spasms in the paralyzed limbs or about the face and neck, are especially frequent in lesions of the optic thalamus. Sensibility is about equally impaired in lesions of the optic thalamus and corpus striatum. There is a greater difference in temperature in lesions of the optic thalamus than when the lesion is in the corpus striatum; in the latter the temperature rarely being more than one degree higher than that of the limbs of the sound side, while in the former case the difference may be one and a half to two degrees, and may persist for a much longer time, perhaps for many weeks.

The aphasic difficulties met with when the lesion is in or just outside of the left corpus striatum, are not generally met with when similar lesions occur about the left thalamus. If, however, the two bodies are damaged at the same time, we shall then find the aphasic troubles and early rigidity and other symptoms more indicative of a lesion in the thalamus. When there is hæmorrhage into the *corpus striatum* or *thalamus*, followed by effusion into the ventricles, we may at first find our patient with an ordinary hemiplegia, which has commenced by an apoplectic, or epileptiform, or simple form of onset, and after a short interval a new hæmorrhage may occur, the blood tearing its way into the lateral ventricles, so that profound coma, stertor and general paralysis quickly come on. In other cases, without any preliminary attack, a large hæmorrhage may take place, and the blood pouring into the lateral ventricles, we have at once a marked apoplectic attack, characterized by deep coma, general paralysis of limbs, and dilated pupils. The temperature is decidedly lowered in all these cases, sinking to, perhaps, 96°, followed in an hour or two—if a fatal result does not speedily occur—by a rapid rise, which slowly continues in cases about to prove fatal, till the death of the patient. Such a fatal ending often occurs within three days from the commencement of the attack.

When the hæmorrhage affects the ventricles we often see tonic spasms of some of the limbs, or, tonic may alternate with clonic spasms of the same parts. In some cases we may find rigidity of the limbs of one side combined with clonic spasms in one or both

extremities of the opposite side. We may also see in this class of cases, a conjugated deviation of the eyes, sometimes present from the first, pointing to the side of the brain on which the hæmorrhage with laceration has occurred. If the coma is not too profound, we may discover some slight signs of sensibility on the side of the body towards which the eyes are turned. From the above-mentioned symptoms we may safely diagnose (in the majority of cases) a hæmorrhage into the lateral ventricles, although sometimes there may be from a lesion in the pons, a combination of symptoms closely imitating those I have detailed.

In the class of cases, however, where the lesion in the pons is small at first and gradually increasing, the hemiplegia is generally of such a nature as to make it referable to a lesion of the pons, and when the lesion in the pons varolii is large from the first, the condition of coma and general paralysis is apt to be associated with contracted and motionless pupils, as in opium poisoning, whereas, in hæmorrhage into the ventricles, the pupils are generally dilated. Tonic spasms are more frequently absent in severe central lesions of the pons, than in cases where the hæmorrhages occur into the ventricles.

There are instances where the symptoms of secondary hæmorrhage into the ventricles are closely simulated; where a hemiplegic condition from injury to the opposite side of the brain becomes complicated by a fresh lesion (either softening or hæmorrhage) in the previously sound hemisphere.

When we have a lesion in the anterior, middle and posterior parts of the cerebral hemispheres, the rule is, to which there are only a few exceptions, that a lesion in either hemisphere of the brain, if of sufficient extent, induces a paralysis of the limbs of the opposite side of the body. Our power to discriminate during life between lesions occupying different situations in the cerebral hemispheres, is constantly increasing, owing to the able work done by our American neurologists and those of Europe.

In our own country the labors and brilliant investigations of Drs. Hammond, Séguin, Putnam, Eads, Mills, Morton, Bartholow, Webber, Amidon, Bannister, Jewell, Hughes, Hamilton, Spitzka and others, have done a great deal towards the solution of the more difficult problems in cerebral diagnosis, and this knowledge will be constantly increasing.

If we have hæmorrhage in the anterior lobe or softening of the

same part caused by embolism or thrombosis of the anterior cerebral artery, we may have implications of the olfactory bulb, or interference with its functional activity by the pressure on the part of the brain where it is situated, so that we may have loss of smell, or impairment of this sense on the side of the body on which the brain lesion occurs, and opposite to the side of the paralysis of the limbs. Lesions of the posterior part of the left frontal convolution, where we have a right hemiplegia, are often associated with the existence of a typical aphasia.

Almost the only sign of a lesion of softening of the posterior or occipital lobe of the brain, is the loss of sight in the eye of the opposite side, as well as paralysis of the opposite limbs. The unilateral loss of sight and the hemiplegia both become established simultaneously. In case of softening, this results from occlusion of the posterior cerebral artery. We get a great deal of cephalalgia when the meninges are markedly affected. We may get more or less prolonged loss of consciousness as the beginning of superficial affections of the brain, and delirium as one of the initial symptoms. We may have convulsions ushering in acute affections of the cortical gray matter and limited tonic and clonic spasms, without loss of consciousness, and in new growths involving the cortex, convulsive attacks may occur with great frequency. We may get, in cortical affections of the brain, no definite paralysis perhaps, but there will be exhibited by the patient great general weakness, with a slow vacillating mode of walking, or actual inability to stand, or we may have a partial hemiplegia, more or less complete paralysis of one arm, with slight lowering of the angle of the mouth on the same side, but no appreciable weakening of the leg. If the lesion is in the third left frontal convolution or adjacent parts, we shall get aphasia, either alone or in association with the partial hemiplegia. If the gray matter in other parts is met with, speech may be affected and there may be well-marked amnesia, or a slow and labored utterance, merely with, perhaps, some mental incoherence. The loss of sensibility in case of hemiplegia due to superficial lesions, is generally very slight, perhaps scarcely appreciable at all, even within a few days from the occurrence of the trouble. The difference in temperature in these cases is also very slight between the paralyzed and non-paralyzed side of the body. We may even get hyperæsthesia in place of any anæsthesia of the paralyzed limbs. We must look at the symptoms collectively, not singly, and in these cases—lesions limited to the

cortical gray matter or causing pressure upon this substance—we should look for mental incoherence or delirium, a partial hemiplegia, a little affection of the leg or face, muscular twitchings in the limbs, absence or distinct loss of sensibility, or of any notable elevation of temperature on the paralyzed side, our regional diagnosis of a lesion of the surface of the brain ought to be readily made.

If we have more severe superficial lesions, such as widespread embolisms or copious arachnoid hæmorrhages, we shall get a profound apoplectic condition, during which our patient may die without our being able to make an accurate differential diagnosis of the seat of the lesion.

With respect to lesions of the cerebellum,—a difficult region for exact diagnosis,—we must remember that, owing to the intimate functional relationship existing between the cerebrum and the cerebellum, the latter acts in response to cerebral stimuli, plays a subordinate part, although injuries or lesions of the cerebellum may seriously irritate the pons and medulla oblongata, or, through the fibres of the superior cerebellar peduncles, may seriously disturb the cerebral hemispheres. It is consequently, as I have said, very difficult to say which of the symptoms met with in any given case are referable directly to destruction or irritation of the cerebellar substance, and which to secondary or indirect effects of these injuries, or if the lesion which caused them is upon adjacent and related parts. As a rule, we may probably safely say that all direct effects resulting from lesions in one lateral lobe of the cerebellum will, so far as they are connected with motility, show themselves principally upon the side of the body corresponding with the lesion. The functional relations of the cerebellum are chiefly with the half of the cord and the limbs on the corresponding side of the body. If we have hæmorrhage or occlusion of the vessels, leading to softening of some part of the cerebellum, we shall get certain symptoms as the result of these lesions. If they occur in the lateral lobe of the cerebellum we shall get loss of consciousness or not, as the lesions are sudden and extensive or not. Pain of a severe nature may be referred to the occipital or frontal region, and is generally paroxysmal, and vomiting is very frequent. Paralysis of the opposite arm and leg may be met with without much diminution of sensibility. This paralysis will be more marked in the leg than in the arm, and will probably be absent from the face. It is different, therefore, in both these respects, from the common forms of hemiplegia, and differing also from the paralysis

produced by superficial lesions of the hemispheres, where, though paralysis of the face may be absent, the loss of power falls more upon the arm than the leg. There may be early rigidity in the paralyzed limbs, spasms about the face, or rigidity of the neck. Speech is not affected and the tongue is not interfered with in its movements. Deglutition, as a rule, is not interfered with generally, although if there is well-marked pressure on the medulla we may find dysphagia and difficulty in articulation. As the superior peduncles are in close proximity to the corpora quadrigemina blindness may come on if they are affected. We should expect no delirium or mental disorder, but perhaps we may find intellectual torpor and drowsiness. Pulse and respiration are generally good. At times we may, from a lesion in the lateral lobe of the cerebellum, have *no* hemiplegia, but only a general muscular weakness of a progressive nature, more marked in the legs than in the arms. Sometimes this prostration is so great that the patient cannot stand or even raise himself in bed.

If the lesion is in the median lobe of the cerebellum we have variance in the symptoms according to the extent and suddenness, and the variable amount of pressure upon the medulla and pons. If, for instance, we had a large hæmorrhage in this situation, causing pressure on the medulla and pons, we may have sudden and well-marked apoplectic symptoms, terminating fatally in a short time. Generally the lesions are not so severe as this in this locality. Hemiplegia would be more likely to be absent than if the lesion were in the lateral lobes of the cerebellum. We may have marked excitation of the genital functions where the lesion is in the median lobe. In both sexes sexual desire is increased, and in male patients there are frequent erections, with or without emissions. We do not get these symptoms where only the lateral lobes of the cerebellum are affected. Sight will be affected if there is a large lesion in the middle lobe, owing to the proximity of the superior cerebellar peduncles, which are in such close topographical relation with the corpora quadrigemina. Tumors are more likely than hæmorrhage to lead to ventricular dropsy or central softening in this situation, by causing impediment of return of blood from the veins of Galen into the straight sinus, and here the symptoms of cerebellar disease may be indefinite, owing to the symptoms induced by the ventricular dropsy and innutrition of the central regions of the brain.

To discover the *nature of the lesion* which has occurred in brain-tissue is oftentimes very difficult. For instance, the question of

the differential diagnosis between hæmorrhage and softening. We have to look at the age and general health of the patient, at the condition of his heart and larger arteries, at the presence or absence of prodromata, at the actual mode of onset of the disease, and at its progress as regards general symptoms during the first few days. In making our *pathological* diagnosis as to the causes that have given rise to the apoplectic condition in a given case, we must determine whether our patient, if he has been found in a comatose condition, has suffered from any external violence causing internal injury, from narcotic poisoning; whether he is suffering from intoxication, from uræmic coma; whether he is in the stupor following an epileptic fit; or finally, whether the patient has actual cerebral disease from rupture or occlusion of the cerebral bloodvessels. In distinguishing between opium poisoning and hæmorrhage into the pons varolii in its central part, while in both cases there is profound coma and pin-head contraction of the pupils, in the former case the coma comes on slowly, while in the latter the coma comes on rapidly. In uræmic coma our patient will present a pale, pasty complexion, puffy eyelids, swollen ankles, and albuminous urine, and convulsions would commence the attack which drowsiness and headache have markedly ushered in, and the temperature of the body begins to fall with the commencement of the uræmic coma, continuing to sink as long as this condition lasts, sinking, in fatal cases, as low as 90° F., while in cerebral hæmorrhage or softening, the lowering of temperature is slighter, and if the hæmorrhage is not fatal in two or three hours, rarely lasts longer than this.

If a young person whom we knew to be affected with valvular disease, suddenly became hemiplegic, we could at once safely diagnose cerebral embolism. Embolism generally occurs in persons under forty years of age, while cerebral hæmorrhage generally occurs after this age; thrombosis and hæmorrhage have the greatest tendency to occur in old people. Long or well-marked prodromata, terminating with an attack of hemiplegia in elderly persons, especially if their heart is weak and the arteries rigid, would incline us to make a diagnosis of thrombosis.

The indications pointing toward hæmorrhage as a lesion would be a profound and lasting coma from which the patient cannot be roused, especially when the attack has not been ushered in by convulsions. Sudden hæmorrhage into the pons varolii, a large hæmorrhage into the lateral ventricles or into the arachnoid sac, would give rise to

such symptoms, which may speedily terminate in death. Multiple embolisms occurring simultaneously over a large tract of the brain, might, however, give us the same symptoms and a similarly speedy death, as when a large atheromatous collection near the aorta is suddenly liberated and carried into the circulation, so that considerable of it is carried to the brain, simultaneously blocking up a large number of small vessels. This, however, would be a rare occurrence. A sudden and profound coma might be produced—although it, also, would be a rare occurrence—by a thrombus completely occluding the basilar artery in nearly its whole length. The onset in these cases would be apt to be more gradual.

In cases of softening due to thrombosis the symptoms go on increasing by successive stages for a week or so, and in softening due to embolism there is very apt to be a remission and diminution of the paralysis three or four days after the beginning of the attack. It is sometimes very difficult, in cases where a hemiplegic attack begins with either a slightly-marked apoplectic condition or with no loss of consciousness at all, to diagnose with certainty between hæmorrhage and softening, except as we know in some cases that embolism has occurred, and in another set of cases where long-continued prodromata point to thrombosis. We have to watch the subsequent course of the illness for the first week. In hæmorrhage there is apt to be a febrile reaction after three or four days, leading to exaggeration of the symptoms, or there may be an increase in the severity of the symptoms, taking place by successive stages, particularly when slight additional bleedings occur at corresponding intervals, and these cases very closely simulate cases of softening by thrombosis. The period of initial lowering of the temperature met with generally in hæmorrhage is either absent or very much less marked in cerebral softening.

In cerebral hæmorrhage, if the temperature rises soon after the attack to 102° or 103°, it very rarely sinks again unless from the shock of a new hæmorrhage, while in softening there may be a rise to 102° or 104°, followed by a sudden fall and subsequent oscillations. In children hæmorrhages are generally arachnoid, as they are also after blows on the head if hæmorrhage comes on. *

* A weakened vascular wall and increased pressure within the vessel are the general cause of cerebral hæmorrhage. It is rare during the first half of life, and generally occurs after fifty years of age. Chronic Bright's disease and chronic alcoholism, also chloral and opium habits, lead to degeneration of vessels, and are thus predisposing

Hæmorrhage is more apt than softening to occur in the middle lobes of the cerebellum, and signs of disease in the optic thalamus are more apt to be caused by hæmorrhage than by softening.

Our prognosis in cases of cerebral hæmorrhage will depend upon the age and state of health of the patient, taken in connection with our view of the situation of the lesion, its pathological nature, and its extent. The friends will wish to know our opinion as to the probabilities of the attack itself being fatal, or what are the chances for recovery of speech and mental power, and whether power will be regained in the paralyzed limbs, and also as to the chances of a repetition of the attack. As to the first question, as to the attack itself immediately proving fatal, we must be guided in our answer by the existing degree of coma. If our patient cannot be roused at all, if there is no reflex action when the conjunctivæ are touched, if there is well-marked stertor with involuntary passages of urine and fæces, the patient may die rapidly in a very few hours; and in cases where death does not immediately ensue or recovery takes place, the persistence of such signs without abatement for twenty-four hours is a grave indication, and the patient will probably die in a day or two.

It is a bad symptom if the respiration is very slow and labored, or if it is quick, with marked irregularity of pulse. A very marked and persistent depression of temperature, commencing with the attack, is a sign also of fatal issue of the case. These speedily fatal cases are occasioned by hæmorrhages into the centrum ovale, with or without rupture into the ventricles, by large bleedings on the surface of the brain or by hæmorrhage into the pons varolii. Very rarely multiple embolisms of the brain or complete thrombosis of the basilar artery may produce like results.

If the patient gets through the first few days after an attack of cerebral hæmorrhage, the result will then be influenced by his gen-

causes. Nearly half the intra-cerebral hæmorrhages are located in the corpus striatum and the region just outside it. The pons and peduncles, the cerebellum, the cortex, the optic thalamus, the posterior and anterior portion of the hemisphere, are also the seats of cerebral hæmorrhage, about in the order I have given them. An elderly person may complain of headache, vertigo, slight mental disturbance, and slight impairment of speech as prodromata of an attack of hæmorrhage into the brain. It must be remembered that the loss of consciousness and of power of motion and sensation are profound and lasting according to the size and location of the hæmorrhage, and that our prognosis is mainly guided by the intensity of the symptoms and the location of the lesion. A combination of hypophosphite of soda and the tincture of nux vomica, as recommended by Mr. Gowers, of England, I have been much pleased with as a nervine tonic, after cerebral hæmorrhage.

eral condition and the state of the other organs of the body, so that a healthy state of liver and kidneys, and good general nutrition may be the means of warding off a fatal termination, which would occur in a less healthy individual. Sudden rise of temperature to 102° or 104°, or acute sloughing of the nates within a few days after the onset of an apoplectic attack, are grave indications. Great difficulty in deglutition is always a grave symptom, since, if it is well-marked, we generally have to do with lesions near the medulla; and severe emotional weakness is another bad symptom. Sudden depression of temperature, with increase or renewal of comatose condition, is indicative of fresh hæmorrhage, although we may get these symptoms in cases of softening from new and sudden occlusions.

If our patient goes through the first twelve days, we do not look for a fatal result from the brain lesion or from its complications.

He will now, probably, slowly regain his power of easy deglutition and speaking, and his mental power, his mental weakness displaying itself merely in an increased tendency to emotional display. He is easily worried and has less self-control, and the memory is somewhat weakened. Rarely, there may be a mental impairment produced which will end in dementia, more especially in elderly people, or when the lesions affect the cortex of the brain. In children, in infancy or at birth, large lesions in the substance or on the surface of the brain may produce idiocy and tendency to convulsions. Respecting the return of motor power to the paralyzed limbs, slight power ought certainly to be regained in three or four weeks, and if it is not, the prognosis in this respect is bad. The later the first signs of returning motility are in showing themselves, the less the chance for complete recovery.

Early rigidity, especially in the upper extremities, is unfavorable, as the limbs are apt not to recover their motor power, but to pass into late rigidity with organic change in nerves, muscles, and joints. This is one of the rarer occurrences in the hemiplegic state. In a great many cases patients will make a good recovery from an attack of cerebral hæmorrhage, recovering from the apoplectic condition and regaining power over the paralyzed limbs, and the more quickly motor power manifests itself in the limbs the more likelihood of its being complete. A recurrence of the paralysis is most likely in persons over sixty years of age, who are affected by arterial degeneration. In younger persons with endocardial vegetation an attack of embolism may be repeated at any time from sudden emotion or violent

exercise, which may so quicken the heart's action as to wash off an embolic fragment, which may block up one of the middle cerebral arteries.

In treating these cases we have no specifics, but must rely on the natural process, and nature will often effect a cure if not interfered with. It often requires the highest wisdom to abstain from interfering too actively with the reparation nature sets up to absorb a clot of blood in the brain. If we are trying to avert a threatened cerebral hæmorrhage, we must insist on absolute rest of mind and body, keep the patient cool, keep the head and shoulders well raised, give milk diet, and keep the heart's action quiet by bromide of sodium, and in treating the actually developed apoplectic condition we must treat our patient in a large cool room, with ice-bags to the head, and keep the head and shoulders well raised, and keep hot bottles at the feet. The bromides and aconite and veratrum viride may be used *pro re nata* to moderate excessive force of the heart's action, and we must stimulate if the respiration is slow and the pulse weak. The bowels may be unloaded by enemata, and the bladder carefully attended to. Quiet, rest, and a cheerful nurse are essential to recovery. Passive movement, frictions, the induced current of electricity (not in an early stage, however) and strychnia in $\frac{1}{32}$-grain doses thrice daily, constitute the principal treatment after a time. The phosphide of zinc $\frac{1}{10}$ grain, or cod-liver oil and phosphorus may be given with advantage at a later date, and also the chloro-phosphide of arsenic (Routh's formula) in 5-minim doses gradually decreased.

We must look after our patient's general health, and rouse his dormant nerves and muscles, at the same time keeping away from him everything prejudicial to his ultimate recovery.

Respecting the clinical observation of diseases of the brain and nervous system, Dr. Thomas Laycock, Professor of the Practice of Medicine, of Clinical Medicine and of Medical Psychology and Mental Diseases, in the University of Edinburgh, speaks as follows:

The law of direction of physiological activity or of the *vis nervosa*, applied to the investigation of diseases of the brain and nervous system, is really an application to clinical research of the well-known laws of reflex action. But very few are aware that the direction of physiological activity indicates also the direction of structural degeneration. For this reason, and because of its great practical importance, I must call your special attention to this general fact. As the late Dr. Waller demonstrated it to be the law of degeneration of both the motor and sensory spinal nerves, and showed its value as a means of both anatomical and pathological research, I have named it the WALLERIAN

Law. I am, however, responsible for extending its application from the spinal cord and nerves to the brain and nerves of special sense. I may say now that, on the report of Claude Bernard, Dr. Waller was awarded the prize of 2000 francs, given by the Academy of Sciences, for experimental physiology in 1856. You will find the extended views of the question in my physiological text-book. The facts are simple. If the two roots of the second cervical pair of nerves of an animal be divided (and this can be done in the dog and cat without exposing the cord), and it is allowed to survive a few days, certain results will follow. The posterior root between the ganglion and the cord will be found to have undergone degeneration, and also its continuation upwards in the cord; whereas, the anterior root and that part of the posterior root still in connection with the ganglion will be unaffected. It is thus shown that the ganglion influences the nutrition of the sensory or afferent nerves, and the anterior columns that of the motor nerves; in other words, degeneration goes on in the direction of physiological activity. Serres observed the same condition in a case of disease of the Gasserian ganglion; he traced degeneration along the decussation fibrils to the opposite hemisphere. So that disease of a sensory nerve which implicates the sensory or intervertebral ganglia will extend centripetally or adcentrically as far as its ultimate connections, and not unfrequently, therefore, reaches as high as the hemispheres, the organ of perception and thought. It is in this way we can understand how insanity results from apparently very remote and unlikely causes. If the degeneration begins exclusively in one set of sensory or motor nerve fibrils, it may be, and often is, limited to that set all the way up or down. We thus understand how it is that in disease one set of fibrils is picked out, as it were, from the rest.

Another point of importance was shown by Waller, namely, that the intervertebral ganglion influences the nutrition of the distal sensory fibrils; for when a mixed spinal nerve is divided on its distal side, both motor and sensory fibrils undergo degeneration. Hence the conclusion that excessive activity or exhausting use of the sensory nerve and ganglia, will affect the nutrition of the sensory fibrils. This seems to be the order of causation in certain kinds of locomotor ataxy.

The problem to solve being, then, the order of symptoms, we have to inquire in any case where in the nervous system the functional or structural changes began, and then follow the line of physiological activity. This is already done with much success in cerebral hemiplegias; but the sensory and trophical neuroses have had little attention paid them in this way. There are two such lines in all neuroses—namely, the direct and the decussating—whether the line of activity be centripetal and adcentric (sensory, afferent) or centrifugal and eccentric (motor, afferent). In either kind, single nerves and nerve-centres, or many nerves and centres may be affected. Affections of the sensory nerves in the latter case influence central parts by what has been termed radiation of sensation —the phrase meaning diffusion, anatomically, of the degeneration among the centres—so that several functions are disordered. I will give you illustrations of these views.

An injury to a sensory or afferent nerve may be followed by varying centric disorder and disease. In traumatic tetanus the spinal trophic system of the flexor and extensor muscles of the lower jaw, limbs, and trunk is so affected that tonic convulsions follow upon a slight touch or even change of temperature; or, the injury may cause a neuralgia and no tetanus, but spasms and epileptic convulsions; or there may be no neuralgia, only illusive sensations, as an aura, numbness, and yet centric encephalic disorders result; or, there may be no change perceptible by the patient, and yet there may be various vesaniæ, such as the so-called "masked" epilepsy, mania, melancholia. I give you as an illustration an instructive railway case. On March 24, 1866, a house-agent and tax-collector, aged 60, weighing 22 stones, was holding on a railway carriage, when the guard

crushed the end of his finger by shutting the door, so that a portion was squeezed off. He suffered much from pain and loss of blood, and reached home faint and exhausted. The finger healed, but in the course of a month after the injury he had a slight tetanic symptom, and in a few days after that a sort of fit. He now complained, also, of numbness and strange sensations in his hand and arm, twitchings of the face, and a sense of weariness and loss of strength, so that, although previously in robust health, he was unable to undergo even slight exertion without a feeling of fatigue. He resumed his office-work for six months, but got slowly worse, becoming highly nervous and dreadfully depressed. He had next numbness of the body and faintness; then by degrees his powers of speech, of motion, and vision failed; and at last he died, September 13, 1867, nearly eighteen months after the accident. This is one of the many kinds of injuries to the nervous system railway accidents cause. What was the probable pathological anatomy? First, degeneration of the afferent fibrils of the injured finger; then of the intervertebral ganglion; then radiation thence, either upon other ganglia, including the Gasserian, or else upon the sensory structures of the cord; next as a sequal, degeneration either of the vessels, or lymphatics, or connective tissue, or of all, so that the functions of both the sensory and motor sides of the cerebro-spinal centres were abolished. The progressive disease, the age and great weight of the sufferer lead to the inference that the degenerations were diathetic.

The element of time is a very important point in the diagnosis and prognosis of this class of cases; the progressive degeneration may extend over several years. In July, 1868, I saw a captain in the Royal Navy, who, fifteen years before, when a midshipman, fell about eight feet as he was descending Table Mountain, Cape of Good Hope. He received a scalp wound, which bled freely, and he thought he must have been made unconscious. The surgeon of his ship examined, but found no fracture, and dressed the wound, which healed well. I found an extensive scar on the scalp over the curve of the left parietal region, and the surface slightly depressed. This had led some to propose trephining. Twelve years subsequently to the injury, he married, and shortly after had habitual headaches, with mental depression, increasing until he became profoundly melancholic. Rest from active duty restored him to comparative health of both body and mind, but his manner continued to be peculiar. He, however, resumed charge of a ship, and so got involved in anxious and harassing night duties off the Irish coast, watching the Fenians. This exhausting work induced a series of neuroses of the encephalon, which were progressively intensified into structural disease, until (when I saw him) he was weak of mind, incapable of movement, passed urine and fæces involuntarily, and had great difficulty of articulation, as well as an incapacity to express his ideas by appropriate words, although he easly smiled and laughed. Early in November of the following year he had successive fits of convulsions, became unconscious, and so died, sixteen years after the injury to the scalp. Long as this period may appear, I knew a major whose insanity was attributed, and I believe rightly, to a scalp wound (sabre cut) received at the battle of Waterloo, thirty years previously.

The relation of these exciting and predisposing causes to time—and long time—is one of the most important points in the observation of diseases of the nervous system. It meets you everywhere. Thus, the tendency to leprosy (which is a trophesy) will lie dormant in Europeans who have been resident amongst a leprous population, and be manifested several years after their return to Europe, when exciting conditions arise. If the constitutional tendencies be diathetic, and not acquired, as in the syphilitic and leprous, the climacteric period strongly predisposes. Any shock to the nervous system, sometimes comparatively slight in character, often serves to weaken the dormant tendency into activity. Marriage, which was thus operative in the case of the naval officer,

is specially influential when entered upon in old age, or at the climacteric period, which practically are the periods when constitutional tendencies to degenerations show themselves. Various diseases of organs which have direct sympathies with the brain and cord are thus apt to be exciting causes.

The decussating anatomy of the nervous system must be noted to observe well these various causes. In the optic nerves and their commissure we have an illustration of both the direct and decussating anatomy of all the sensory nerves of the trunk and limbs. But afferent nerves, which do not naturally subserve to sensation, will influence the opposite side of the central axis. Thus, there is a connection between wasting of one ovary, or one testis, and wasting of the opposite half of the cerebellum. I think I have seen cases of a like relation between disease of one kidney and the opposite half of the cerebellum. An affection of one knee, or one foot, will affect the kidney or the ovary on the opposite side. Nay, it would appear that the milk in the two mammæ is secreted differently from this unilateral action of the nervous system. It is well known that infants will refuse the milk of one breast and take that of the other. The decussating influence of the injured ciliary nerve of one eye in inducing inflammation of the other is another instructive example of these trophical sympathies.

The law of degeneration, as a retrocession to a lower kind of tissue-change, may be applied to the pathological anatomy and chemistry of organs and tissues, and enable us the better to understand the neurotic causes of morbid changes. Thus, nervous debility, considered as a deficiency of trophic energy, will coincide with anatomical and chemical tissue-changes of a lower type. The production of uric acid, the *materies morbi* of gout, is an illustration; it is a normal chemical product of transformation of tissues in reptiles and birds; in man it is abnormal, being a retrocession from urea. So lactic acid appears to be the result of a retrocession in muscular transformation from a higher compound. Carbons and hydrocarbons as pigments and fats follow the same law as to place of production; amyloid degenerations are chitinous.

In diathetic anatomy, diagnosis, therapeutics, the evolutional law of tissue-anatomy upon which I found my clinical view of diathesis is an important guide to pathological inquiries. Nothing can be more vague than the current doctrines. Eminent French physicians speak of a "herpetic" diathesis, or of an asthmatic diathesis—phrases that have really no definite application to tissue-changes, and are, I think, worse than useless. I must remind you that the word diathesis means a special putting together of the fundamental elements of the body, and has no regard to particular organs or viscera, except in so far as a particular tissue predominates therein. The general law to which I refer is that with which you have been made acquainted already, and is the order of evolution of tissues in the embryo. This order indicates the general or common pathological relations of fundamental tissues. Firstly, the germinal membrane appears as the common basis of all; then follows its division into the "mucous" and "serous" layers. Out of the serous layer is evolved the whole voluntary motor apparatus of bones, muscles, aponeuroses, ligaments, and serous tissues; so that, as they are all related to each other by common origin, they are related to each other nutritionally and diathetically, and have probably a common relation to a trophical system. The heart and vascular system have a like common evolutional origin out of the vascular layer of the embryo, which, however, is a conjoined product, and has the conjoint qualities of the mucous and serous layers. In diathetic anatomy the difference is shown by the distinction between gouty degenerations affecting the structure of the heart and arteries and of the synovial membranes of joints, and the rheumatic, which involve the fibrous structures and fibrous pericardium, and aortic and mitral valves.

The hereditary tendencies to diathetic diseases and degenerations as thus defined and

fixed on an anatomical basis are more easily comprehended when we remember that tissue-changes in plants are hereditary, and that consequently it is a regulative principle, as vis nervosa, which, in animals endowed with a nervous system, must be operative on the sperm and germ-cells. Now, a regulative energy, manifested as the "nisus formativus," is the special property of these minute portions of matter, and consequently it must be by a concentration of that energy as vis nervosa on the genetic glands, that the peculiar property is supplied. If, therefore, the innervation be defective in regard to these glands, the regulative or evolutional power will be defective. It is thus I explain how congenital degenerations of structure and defects of function and form take place, from deficient vis nervosa in the parents, for. in these sperm-cells and germ-cells, as in other tissues, the law of degeneration is retrocession to a lower type. The nature and results of that defect in brain nutrition upon which hereditary insanity depends is a striking illustration of this law of hereditary disease and defect; it is the lower or animal appetites and instincts which crop out in hereditary insanity.

Before we consider special tissue-changes as trophesies, let us clearly understand what we mean when we speak of loss of tone, of nervous debility, and of defective innervation. It is clear, from what I have said, the phrases may refer either to defective vital energy in general, or to defective regulative energy especially, in which case it would be to the sensory portion of the nervous system we should look. Now, when we are made conscious of this class of changes, pain, languor, unease, and other like feelings are experienced. Hence, it seems useful to inquire with reference to two kinds of vis nervosa, the one as being a molecular energy, necessary, like heat, to all healthy tissue-work, the other regulative of its production and application. This latter is, therefore, needed, not to the end that the tissue changes shall take place—for we have seen that they can and do go on independently of nerve—but that they shall take place in their proper or normal order. For example, if a defect in a nerve or nerve centre (nervous debility) is followed by the production of heat or of uric acid in the tissue it innervates, these changes occur because the tissue is set free from the regulative restraint exercised by the nerve or nerve centre. Now, I think clinical facts enable us thus to distinguish two kinds of trophic vis nervosa with corresponding anatomical seats, for we can differentiate a regulative from an executive kind, just as we distinguish a sensory and a motor. Here, again, the law of evolution helps us to a clearer understanding. Just as the trophic vis nervosa is an evolution and differentiation of vital energy, so that by which we are conscious and act volitionally is an evolution and differentiation of the regulative element of trophic vis nervosai It is that regulative principle which, as manifested in nutrition and development, was, and indeed still is, termed, the *anima psuche*, soul; and as manifested in mental life, as the *animus*, mind. This unity and continuity of vital phenomena is the great truth of medicine, as it ought to be of philosophy. I do not know in the whole range of the practice of medicine questions of greater importance than those comprised in the relations of nervous debility, in the scientific meaning of the term, to states of consciousness. It implies not only a true knowledge of the relations of pain to disorder and disease, whether in the merely corporeal forms, as tenderness on pressure, hyperæsthesia, neuralgia, and of diminished and abolished sensibility, as anæsthesia—for pain and anæsthesia mean practically changes in the vis nervosa—but of all mental suffering. Pain and suffering are so commonly associated with disorder that the word disease is its synonym, and the ancient word pathology means primarily the science of suffering. Hence it is that the psychology of pain and suffering is so important a division of the practice of medicine; for how can we understand otherwise the commonest experience—*e. g.*, the use of opium and other sedatives in inflammations and painful diseases?

What, then, does pain mean in general?

When all the nutrient and mechanical work of the body goes on according to the rule or *norma* of vital activity, the functions are said to be normal and regular, and the body healthy. Corresponding to this normal bodily condition is a mental condition, the feeling of health and of being strong and well, which, if contrasted with the mental state that corresponds to what is abnormal, is pleasurable. It has been named variously, but perhaps the best term is cœnæsthesis, or common sensibility; morbid states of it are to be classed with the *æsthesæ*. The feeling of ill-health generally, or malaise, or whatever name be given to that which accompanies what is abnormal, if there be a feeling at all, must have its seat in a like portion of the nerve-centres as the feeling of health, and this, in accordance with the principle formerly laid down as to the seat of all conscious changes, must be in the brain. Both states of consciousness correspond in regard to the body to that unity in regard to mind which the metaphysicians name the "ego;" hence these facts prove, in conjunction with many others, that there is a trophic corporeal centre, or series of centres, just as there is a mental centre or series of centres. This we shall be able to fix in a well-defined basilar region of the encephalon, which includes the medulla oblongata, cerebellum, and cerebral ganglia. Whatever may be said of local pain or uneasiness may be said of these general feelings. Hence we must remember as an important fact in clinical observation that all pain, whether it be local or general, and however named, may be illusive as to both seat and cause. It is so with the feeling as to health and unhealth, for, just as in a neuralgia, a person may feel as if he had disease of an organ when it is healthy, and *vice versa;* or when strong and well may feel ill and weak, and have delusions as to the nature and cause of his illusive illness and weakness. The term "well" means, as thus used, that there is no disease of organs, or tissues, or blood, as causes of the feeling of illness, but that there is central disorder or disease, as a neurosis, termed hypochondriasis and hypochondriacal melancholia. When it is not purely sensorial the painful state is best named dysphoria. These centric suffering states (phrenalgiæ) are often as painful as neuralgiæ. I have known hypochondriacs with the feeling of muscular debility, yet strong in muscular development, as incapacitated for labor as if really weak and ill in their muscular system. On the other hand, a patient seriously diseased may feel quite well—may have, indeed, a pleasurable feeling of health. This I term euphoria; it is this, when manifested in cases of phthisis, which has been termed the *spes phthisica*. A wider euphoria is seen in certain cases of insanity with paresis, in which, from a particular kind of morbid brain nutrition, the patient thinks himself endowed with strength beyond estimate. A third class of cases are those with no sense or feeling; they have apathy or aphoria. Such persons, when very seriously ill—ready, in fact, to die—make no sign of feeling ill. This state occurs in dangerous cases of epidemic cholera and in fevers of a bad kind; the patient will go about wholly unconscious of serious illness or of his impending death.

What is said of these general bodily feelings, as commonly altered in disease, applies equally to special bodily feelings and conditions. Exaltation, perversion, abolition of sensibility have their respective trophic conditions. The results of anæsthesia of the pulmonary system, with evolution of motor vis nervosa, are seen in another form than the *spes phthisica*, when tubercular meningitis comes on in the course of a phthisical case. Even with large vomicæ the cough and expectoration will cease, the voice, as the patient raves deliriously, becomes loud and strong, and the corporeal strength marvellously developed—conditions all due to changes in that basilar trophic region I have hinted at. On the other hand, there are cases of insanity in which the central trophic region is defective in both sensory and executive or motor vis nervosa, and the results are wholly different, manifested as low forms of pneumonia, sometimes ending in gangrène of the lung; precisely for the same reason as sloughing occurs in certain kinds of palsy, as in typhus and paraplegia.

The clinical rule deducible from these considerations is, that when we desire to ascertain the causes and consequences of trophic nervous debility, we inquire whether it is the regulative—*i. e.*, sensory vis nervosa that is deficient—or the executive—*i. e.*, motor. Excessive use (functional activity) often determines this. Pleasurable sensory excitement, if excessive, is a using-up of the sensory or regulative vis nervosa. This is one cause of the debility induced by sexual excesses, and of locomotor ataxy as a special consequence of that debility. Pain, too, when excessive, is exhausting. Excessive thought, without anxiety, uses up the materials subservient to sensory excitation; and in this way the regulative energy as regards the organs and tissues may be defective, and neurotic disorders of all kinds follow. But excessive thought, with mental anxiety, care, and pain, as grief, is much more exhausting, and therefore more commonly followed by trophesies. In the exhaustion caused by sexual excesses of males a third element is added—viz., the waste of a highly evolved tissue analogous in chemical composition and in vital endowments to brain—viz., the sperm-cell proper. In the sexual excesses of the female, this cause is not so operative, but chiefly the sensorial exhaustion of excessive pleasurable excitement. In like manner, the loss of blood, as in hæmorrhages, or of albuminous nutrition, as in albuminuria, or the want of proper food, enfeebles both the regulative and the executive portions of the trophic system.

Induced in these and other ways, nervous debility causes a variety of both local and general diseases of organs and tissues, which necessarily differ almost infinitely, according to the kind of tissue and the portion of the nervous system involved, and the causes thereof. It will help greatly to understand and classify and treat these if we know what is general as to nerve and tissue, and what is purely local. For example, there is a whole class of gouty tissue diseases which are essentially neurotic, and to be separated from those in which there are local changes as causes. Before inquiring, however, into these, we must first consider tissues in their relations to the nervous system, and then mark out a clinical trophic anatomy as a guide to etiology, diagnosis, and therapeutics.

Dr. Ferrier, speaking of the lesions of the brain, says: "The brain may be considered as divided into a motor and a sensory zone. The *motor zone* includes the convolutions bounding the fissure of Rolando, viz.; the ascending frontal and the bases of the three frontal convolutions, the ascending parietal and postero-parietal lobule, and the internal surface of the same convolutions or para-central lobule. In this zone are differentiated centres for the movements of the limbs, head and eyes, the muscles of expression, and those of the mouth and tongue. The centres of the leg and foot are situated in the postero-parietal lobule, those for the arm in the upper third of the ascending frontal, those for the hand and wrist in the ascending parietal, those of the facial muscles in the middle third of the ascending frontal and base of the second frontal, those for the mouth and tongue at the lower third of the ascending frontal at the base of the third frontal, and for the platysma at the lower extremity of the ascending parietal, just posterior to the mouth centre. The posterior third of the upper frontal convolution and corresponding part of the second frontal, contain the centre for the lateral movement of the head and eyes.

The frontal regions in advance of this centre, although anatomically related to the motor division of the internal capsule, do not seem directly connected with motor manifestations as judged by the negative effects either of irritation or extirpation.

"*Irritative lesions* of the motor zone proper, such as may be induced by syphilitic lesions, tumors, spicula of bone, depressed fractures, thickening of the membranes, etc., cause convulsions, which may remain limited to one limb, or one group of muscles without loss of consciousness, or affect the whole of the opposite side with loss of consciousness, or become more or less bilateral, with all the symptoms usually observed in so-called idiopathic epilepsy. If the convulsive phenomena begin always in the same way, and if they frequently remain localized in one limb or one group of muscles, and especially if paralytic symptoms manifest themselves, the exact position of the lesion in the opposite hemisphere may be accurately diagnosed." (See cases by Hughlings Jackson, *Clinical and Physiological Researches on the Nervous System*, (reprint) 1873: Dr. Dreshfield, *Lancet*, February 24, 1877; Dr. Brammell, *Brit. Med. Journal*, August 28, 1875; MM. Charcot and Pitres, *Revue Mensuelle*, 1877.)

Destructive lesions of the motor zone cause general or limited paralysis of voluntary motion in the opposite side of the body, according as the lesion affects the whole of the motor zone, or is limited to special centres within this area. The causes of destructive lesions of the cortex may be various—hæmorrhage, laceration by wounds, etc. One of the most common causes is embolism or thrombosis of the arteries supplying the cortical motor area. These are derived from the sylvian artery of the middle cerebral. The cortical branches may be occluded without interfering with the circulation in the corpus striatum, which is supplied by special branches, as shown by the researches of Diult and Heubner. When the motor zone is affected by general destructive lesion, complete hemiplegia of the opposite side results, in all respects like that resulting from destructive lesion of the corpus striatum and anterior portion of the internal capsule. In this form of paralysis the loss of motion is most marked in those movements which are most independent, hence, the arm is more paralyzed than the leg or face, and the hand more paralyzed than the shoulder movements of the arms. This has been accounted for by the fact that the centres for bilateral movement are intimately associated in the lower ganglia; hence, the stimulus from one hemisphere can, to a certain extent, call forth the action of the conjoint

motor nuclei. The electrical contractility and nutrition of the muscles is not affected by paralysis of cerebral origin. The nutrition of the muscles may, however, suffer from disease, and frequently paralyses of cortical origin are followed after a time by rigidity and contraction, accompanied with descending secondary sclerosis of the motor tracts of the crura, pons and lateral tracts of the spinal cord. In some cases the descending degeneration invades the anterior cornua of the spinal cord, and atrophy of the paralyzed muscles ensues. Occasionally, from limited lesions of the cortical motor area, complete hemiplegia may occur on the opposite side for the time at least. This is to be explained by the fact that sudden establishment of a destructive lesion may cause such commotion or perturbation of the centres in general, that their functions are for the time suspended. But in such cases those centres which have been only functionally suspended will again resume their functions, and the paralysis will disappear, except of those movements the centres of which have become permanently damaged.

Limited lesions of the motor zone cause paralyses of those movements the centres of which the lesion invades. The result is not complete hemiplegia, but a *monoplegia* or *dissociated* paralysis. Hence, from a cortical lesion we may get a paralysis of the arm, or of the arm and face, or of the leg and arm, or of the face alone, or of the lateral movements of the head and eyes. Numerous examples of these monoplegias resulting from limited cortical lesion have been collected by Charcot and Pitres (*Revue Mensuelle*, January, 1877, et seq.; abstract in *Lon. Med. Record*, in April, 1877). The morbid process which, while circumscribed at first, causes a monoplegia, may advance to other centres, and after a time produce general hemiplegia of the opposite side. Hemiplegia so resulting is a succession of monoplegiæ, and is a sure indication of cortical disease. It is to be noted that destructive lesion of the mouth centre (Broca's region) on one side does not cause paralysis of articulation, owing to the fact that each centre has a more or less complete bilateral influence over the movements of the mouth and tongue. Destructive lesion of this centre in the left hemisphere generally gives rise to aphasia without paralysis of articulation.

In bilateral lesions there is both aphasia and paralysis of articulation (see Dr. Barlow's case, *Brit. Med. Journal*, 1877, vol. ii., p. 103). Limited cortical motor lesions are frequently associated with transitory rigidity of the opposite side of the body; and if the lesion is

complete, the local paralysis or monoplegia will remain permanently, and may be accompanied by late rigidity and descending sclerosis of the motor tracts, as has been shown by Charcot (op. cit.). These monoplegiæ frequently alternate with unilateral convulsions, owing to the morbid process occasionally inducing irritation of the neighboring centres. Destructive lesions of the frontal and orbital regions cause no motor paralysis or any very evident physiological symptoms. In the recorded cases of bilateral lesions, symptoms of dementia to a greater or less extent have been noted.

Sensory Zone.—From experiments on the brain of monkeys by means of the complemented methods of excitation by the electric current, and destruction of the gray matter of the cortex, the writer has arrived at the conclusion that in the regions lying posterior to the motor zone there are differentiated centres of sight, hearing, touch, smell, and taste. The sight centre is situated in the angular gyrus, and embraces also the occipital lobe—the occipito-angular region; the centre of hearing is localized in the superior temporo-spheroidal convolution; the tactile centre is situated in the hippocampal region; while the centres of smell and taste are situated together at the lower parts of the temporo-sphenoidal lobe.

Destructive Lesions.—Unilateral destruction of these sensory centres does not, however, appear to permanently abolish sensation on the opposite side of the body. It is only when the lesion is bilateral and in corresponding points that the loss of sensation is thorough and permanent. Hence the fact is to be accounted for, that in man, as a rule, unilateral destructive lesions of the regions indicated are latent, or not, so far as at present known, accompanied by any objective symptoms. Numerous cases of this kind are on record. No secondary descending degeneration of the spinal cord has been observed in these cases. Until evidence is increased from human pathology of the occurrence of loss of sensation from lesion of the cortex—and this the writer holds is to be looked for in bilateral destructive lesions—pathologists in general reserve their opinion as to the explanation of the latency of the lesions in question. But though the pathological evidence in favor of the localization of distinct sensory centres is yet comparatively slender, it is daily increasing. Though numerous cases are on record of lesions in the angular gyri and occipital lobe without symptoms as regards vision, there are others, more particularly of lesions of the medullary fibres of this region, in which hemiopia towards the side opposite the lesion

has been observed. Some of these cases may perhaps be explained by direct or indirect lesion of the optic tract, but others cannot be so accounted for. It has been established by the researches of Türck, Charcot, etc., that destructive lesions of the posterior third of the internal capsule, external to the optic thalamus, cause hemianæsthesia of the opposite side of the body. The hemianæsthesia of organic origin exhibits the same symptoms as are observed in what is termed hysterical hemianæsthesia. In this condition there is loss of tactile sensation, and more or less complete loss of sight, hearing, smell, and taste, on the side opposite the lesion. The affection of sight, which is not accompanied by any change in the eye discoverable by the ophthalmoscope, is characterized by dyschromatopsy, and a remarkable contraction of the field of vision.

The loss of hearing is very marked, if not absolute, and similarly as regards smell and taste. It is evident that the lesion situated in the medullary fibres is not an affection of sensory centres, and that it is simply a solution of continuity of the centripetal paths which radiate out into the differentiated sensory centres of the cortex. The exact destination of the special sensory paths the writer has indicated above, and to this the special attention of physiologists and pathologists should be directed. The writer is likewise of opinion that the loss of smell and taste, which is occasionally observed to result from a blow on the occiput or vertex, is in many cases due to injury by counter-stroke to the centres of smell and taste, which are situated in such a position as to be specially affected by violence so directed. There is no doubt that in some cases the loss of taste might be accounted for by rupture of the olfactory tracts or nerves, such as those in which taste is lost only for flavors, which are compounds of smell and taste. But there are others in which there has been clear loss both of smell and taste independently of each other; cases which can only be satisfactorily accounted for, in the writer's opinion, in the manner in which he has indicated.

Irritative Lesions.—Though the pathological evidence in reference to the localization of sensory centres is as yet but deficient, at least as regards paralysis of the special senses from destructive lesion of the cortex, there is good reason for believing that in cases of insanity, accompanied by sensory hallucination, as also in certain cases of epilepsy ushered in by subjective sensations, such as flashes of light and color, loud sounds, disagreeable tastes and smells, etc., the phenom-

ena are the result of some morbid irritation of the cortical centres, the anatomical substrata of ideation.*

CHAPTER XIX.

DIPSOMANIA.

Dipsomania is a form of physical disease, and it has been aptly defined as "an uncontrollable and intermittent impulse to take alcoholic stimulants, or any other agent, as opium or hashish, which causes intoxication—in short, a methomania." We must distinguish between this disease of the nervous system, which Professor Kraft-Ebbing classifies as one form of periodical insanity, and the physiological state in which the individual merely chooses to indulge in liquor to excess. The great question of importance is to distinguish the two states or conditions, when the result, intemperance, is the same. We must observe whether there are symptoms in our patient which can be referred to primary disease of the nervous system. We must examine for hereditary influences, which, when present, lead us, of course, to suspect disease. Early development of the appetite for stimulants points in the same direction; but the great diagnostic point attending the *disease* is the irresistible impulse by which the patient is impelled to gratify his morbid propensity, being during the paroxysm, blind to all the higher emotions and pursuing a course against which reason and conscience alike rebel. It is frequently seen that these paroxysms are preceded by considerable

* The attention of the general practitioner and student is particularly directed to these trustworthy and accurate topographical descriptions of Dr. Ferrier of the lesions of the convolutions of the brain and cortex cerebri in connection with observed clinical symptoms. Their value can hardly be overestimated. It is to such anatomical investigation into the topography and homologies of the cerebral convolutions and to experimental researches such as those of Ferrier, Hitzig, Charcot, and Hughlings-Jackson, we look for the full and perfect understanding of the pathology of the cortex cerebri. It will be seen that physiological experiment is in advance to-day of clinical observation. This is due to the vague manner of defining the locality of lesions. Every physician should endeavor to locate lesions coming under his notice and make a careful study of his cases.

disturbance of the nervous system. The patient perspires and is sleepless, uneasy and prostrated, and so craves some stimulant.

Between the paroxysms he is different from a common drunkard, in oftentimes disliking exceedingly all stimulants, and is then a useful member of society. The patients with whom the medical profession will come in contact as sufferers from this disorder of the nervous system, are not from the lower classes, as many suppose, but come chiefly from the brain-working and cultured classes, and embrace lawyers, physicians, clergymen and merchants. Dipsomania has been described under three forms: acute, periodic and chronic. The acute form is the rarest, occurring only after exhausting diseases or excessive sexual indulgence. The periodic form is by far the most frequent, and is observed in persons who have suffered injury to the head or spine, females during pregnancy, and at the catamenial period, and also in men whose brains are overworked.

This form is frequently hereditary, and, consequently, proportionately difficult of cure. These patients may abstain for weeks and months from all stimulants, and may, during this interval, positively dislike them. At last, however, the patient becomes uneasy, listless and depressed; is not inclined to apply his mind, and finally begins to drink and continues until intoxicated. It is an interesting and rather remarkable fact that with this class of cases, as Charles Lamb, in his *Confessions of a Drunkard*, pertinently remarks: "To stop short of that measure which is sufficient to draw on torpor and sleep, the benumbing, apoplectic sleep of the drunkard, is to have taken none at all. The pain of the self-denial is all one."

The patient continues this course for ten days, or perhaps a fortnight, and then bitterly regrets his fall. This often runs on, if not checked, into mania, and lapses into dementia. The last, and a very common form also, is the chronic form; and we have always found this to be the most incurable form of the disease, as the patients are incessantly under the irresistible desire for alcoholic stimulants. I think the latter class of cases require constant seclusion in an asylum if they wish to be free from intoxication, as a discharge or leave of absence is always followed by a repetition of the same acts. In a majority of cases of this nature, we find hallucinations of sight and hearing, which oftentimes produce very painful moral impressions, and at times even great terror in the patient. Cases of delirium tremens are excluded in these remarks.

These patients manifest confusion of thought, perversion of feeling,

suicidal tendencies, tremors of the facial muscles and tongue, anæsthesia of the extremities at times, and very often paralytic symptoms, going on to general paralysis. The subject of hereditary metamorphosis of the diseases of the nervous system is of great importance in this connection. As a result of intemperance in the progenitors, we find transmitted to the offspring, allied but different forms of the neuroses. It may be dipsomania, epilepsy, chorea, or actual insanity, or a proclivity to crime. It is, at all events, an aptitude for some form or other of nervous disorder, the particular form being often determined by causes subsequent to birth. The law of hereditary transmission applies equally to the victims of dipsomania as well as to the other insane classes, and is to be studied, I think, in three divisions, according as it is manifested. First, in predisposition or simple aptitude, the result of a defective organization, and a weakened or diseased nervous system, as a result of which, the possessor is predisposed, or has a tendency to seek for the relief obtained temporarily by alcoholic stimulants, when laboring under physical or mental depression; second, in the latent state or germ of this disease; and third, in the actually developed disease. The first of these states the predisposition or aptitude being hereditary in a strong degree, is universally acknowledged to be the most difficult to eradicate, and requires the wisest sanitary conditions adapted to both body and mind. Most people doubt the existence of the second or latent state or germ of the disease, ignoring the law of progressive development, and such persons find it difficult to believe that dipsomania coming on in maturity, as a result of ill-health, mental shock, etc., may have originated in intemperance in the parent or grandparent. Yet this is a fact, and is just as easy of comprehension as the fact well known to neurologists, that brain-tissue degenerations and mental diseases may be separated by long intervals of time, from the too premature and intense stimulation of the brain in the young, which causes these nervous diseases. One very important organic law which should be universally understood in this connection, is, that morbid impulses and characteristics and traits may disappear in the second generation and break out with renewed intensity in the third, although a tendency or predisposition may be transmitted to the offspring, and under good hygienic and other favorable circumstances, die out and fail to be transmitted any further. I have remarked in my experience with the insane, whether the exciting cause be intemperance or something else, that the cases most unlikely to recover, are those where

the insane temperament or diathesis is clearly marked, and where the predisposition to disease is inherited. Such patients, although they may have lucid intervals, rarely, if ever, entirely recover.

I think the insane impulses to drink, which overcome all the efforts of the individual who inherits a tendency in this direction, present the same indications for treatment as do the suicidal and homicidal impulses, namely, seclusion from society, and the occasion of temptation, and the necessary restraint in a suitable institution. I do not agree with that class of persons who hold that, under all circumstances, the dipsomaniac is to be treated as an invalid, with the utmost gentleness and forbearance, and then, with the strangest perversity, turn round and tell you that inebriety is no excuse for criminal actions, and fine and imprison perhaps, the unhappy man who has been driven into the debauch by an irresistible craving for drink, when properly he should be treated as insane, and should be sent to an inebriate hospital for restraint, treatment and cure. There are some people who appear to think it no disgrace for the head of the family to leave his home and business and insanely hide himself away in the slums of the city to drink until intoxicated, and continue this course for several days, and repeat this every three or six months until health, business and family ties are ruined; but who would foolishly look upon it as a great disgrace to send him away from home for the proper medical care and attention and restraint necessary for his restoration. It should be the province of every conscientious family physician to educate those families committed to his charge, respecting their duties in such cases, and to instruct them that *inebriety is a disease curable as other diseases are, if the patient will but submit himself to the proper restraint for a sufficient length of time to be cured.* Our laws at present fail lamentably in preventing intemperance, and this is due in a great measure to the false view in which this disease is held by the judiciary. The different forms of dipsomania correspond in their manifestations, and oftentimes in their causes to other cases of mental disease, and cannot properly, I think, be separated from them as regards the fact of the disease.

Dipsomania often appears as a result of the same causes that operate in the production of other types of mental disease, such as ill-health, severe mental shock, blows on the head and spine, and sunstroke. We are dealing in both cases with abnormal cerebration; in the one case associated with mania, melancholia, dementia and idiocy; and in the other with a depraved alcoholic appetite—an irresistible

impulse which the mind seems powerless to control; an insane impulse, just as surely as a homicidal or a suicidal impulse is an insane impulse. I think that when our cerebral pathology, which is as yet in its infancy, becomes more generally understood, it will be found equally applicable to this as to other forms of insanity. The terrible insane craving for alcoholic stimulants is often the result of a lowered vitality or abnormal organic development of the nervous system that has descended from generation to generation, gaining in intensity until it manifests itself by the complete loss of self-control and active inebriety in children and grandchildren, after they once taste intoxicating liquors and indulge in them.

The blunted moral perception which so many inebriates exhibit, and which renders them peculiarly liable to a relapse after they leave an asylum, is to be regarded in the same light, I think, as the perverted moral sense in moral insanity. In every institution for the insane, we find inmates who exhibit no obvious intellectual aberration or impairment, the *moral* faculties being deranged while the *intellectual* faculties remain apparently in their normal condition. The manifestations of moral insanity may be a simple perversion of some sentiment or propensity under certain exciting causes; and I think this exactly comprehends cases of dipsomania with loss of self-control and perversion of the moral sense. The person, of course, is aware that the act is wrong in both instances, but the control which the intellect exercises over the moral senses is overborne by the superior force derived from the disease. I have been told many times, by both insane patients and dipsomaniacs, that the feeling on the one hand to commit some insane deed, and on the other to give way to alcoholic appetite, was contemplated in both instances with horror and disgust, and at first successfully resisted, until at last, having steadily increased in strength, it bore down all opposition. What can be a more powerful argument in favor of the disease theory of dipsomania?

Pathology of Dipsomania.—The basis of our cerebral pathology is the fundamental principle that healthy mental function is dependent upon the proper nutrition, stimulation and repose of the brain; and upon the processes of waste and reparation being regularly and properly maintained. We know that the cerebral cells are nourished by the proper and due supply of nutritive plasma from the blood, and that this is essential to healthy function; and, indeed, the ultimate condition of mind with which we are now acquainted, consists

in the due nutrition, growth and renovation of the brain-cells. If, now, we take into the system an amount of alcohol that causes the blood plasma to convey to the brain-cells a noxious and poisonous in place of a nutritive substance, stimulating the cells so as to hasten the progress of decay and waste beyond the power of reparation, and impressing a pathological state on them, we must inevitably have resulting a change of healthy function and a certain amount of disease induced.* Owing to the abuse of alcohol we have resulting a change in the chemical composition of the cerebral cells from the standard of health, which is the foundation of organic disease, as it prevents and interrupts healthy function. As a result of the overfilling of the cerebral vessels or hyperæmia of the brain from the

* It would seem most probable that the disease of inebriety arises from disorder in the sensory zone of the brain. We have in this disease an unnatural diseased appetite or taste. Molecular changes, or a sub-inflammatory irritation of the temporo-spheroidal lobe in its lower parts (the differentiated centre for smell and taste), would naturally produce abnormal sensations of taste and pervert it, inducing that periodic insanity—dipsomania—with its train of unnatural, inordinate cravings; the indication of perversion of normal nerve-function. The *disease of inebriety*, and the alcoholic diathesis, depends, I believe, and is the result of, *some morbid irritation of the cortical sensory centres*. I think we have good reason for believing this, and its acceptance by the profession, as a disease of certain parts of the brain (a thing no more difficult of belief than that insanity, with sensory hallucinations, is the result of a similar lesion), probably dependent upon special molecular changes, perverting brain-function, a condition markedly hereditary, as are most abnormal conditions of the centric nervous system, and evinced outwardly by great nervous irritability or restlessness, unnatural sensations, an uncontrollable desire for alcoholic stimulants, and a disposition to frequent fits of intoxication (the more prominent symptoms of this neurosis) would do much to render a hitherto vexed question conclusive and scientific.

The pathological evidence in favor of the fact that a departure from a healthy structure of the nervous apparatus exists—as in mental disorders—in dipsomania, was at first slender, has been yearly increasing, and is to-day unanswerable and conclusive. I also claim that, with the important and essential aid of private hospitals, we can successfully antagonize the force of this disease and cure it, by restoring to its normal condition the molecular nerve structure as in the case of insanity. The treatment of this disease, therefore, is worthy of the highest consideration of the entire profession. I have treated many very brilliant professional and business men (for it is the finely organized brain and not the coarsely developed one that is affected by this disease) at my private retreat, and by isolation, complete mental rest, the removal of all care and responsibility, a complete control on my part of my patients' habits and surroundings, and the use of quinia, strychnia, zinc and electricity, I have sent these men, and not a few women, back to their places in society and business permanently cured, so that they have achieved honor and success. The term "drunkard" is worthy alone of the dense ignorance of fifty years ago respecting this disease. It is a misnomer. These persons are suffering from a type of mental disease. They want to be cured, and they *can* be cured, and it is the fault of the physician if they are not.

long-continued use of alcohol, we have at first symptoms of irritation, due to increased excitability of the nerve-filaments and ganglion-cells of the brain. The symptoms of exhaustion and depression occurring at a later stage are due to lost excitability of the nerve-filaments and ganglion-cells of the brain, owing to a want of the proper supply of arterial oxygenated blood to them. This is caused by the excessive cerebral hyperæmia, the escape of venous blood from the brain being obstructed; the result being that no new arterial blood can enter the capillaries. We may have apoplectiform or epileptiform attacks, and paralysis occurring in the course of these cerebral hyperæmias, and they may be due either to obstructed escape of venous blood or to secondary œdema of the brain, in which transudation of serum takes place into the perivascular spaces and interstitial tissue of the brain with consequent anæmia. Until very lately we have known little respecting the pathology of the nervous system, and consequently comparatively little information has been gained regarding the morbid changes that take place in the brain and its appendages as a result of the abuse of alcohol. Such knowledge in this direction as we do possess, shows that analogous changes take place in chronic alcoholism and chronic insanity—namely, atrophy and induration of the brain, and thickening and infiltration of the membranes. The nerve-cells have also been found to be the seat of granular degeneration in some instances, and some histologists have claimed to have discovered fatty degeneration of the various brain elements. Respecting the latter changes, Dr. J. Batty Tuke, of Edinburgh, who is one of the most successful of modern investigators in the department of morbid cerebral histology, gives it as his opinion that the application of the various tests for oil will fail to detect the presence of the so-called "free oil-globules" in the substance of the convolutions, which he considers to be but the scattered debris of granular cells. According to the great pathologist, Rokitansky, we find thickening and increase of the pia mater and arachnoid, and permanent infiltration of the former and a varicose condition of its vessels, as a result of continued abuse of alcohol. As the state of the pia mater is unquestionably closely related to the higher functions of the brain, the latter must suffer more or less as the result of such an abnormal condition of the former. If there exists a permanently congested and thickened state of the pia mater, it is extremely probable that if it becomes suddenly turgid and hyperæmic as a result of severe emotional disturbances, we shall

have, resulting from the increased pressure on the brain, coma, epileptiform and apoplectiform attacks and other grave nervous symptoms. It is fair to conclude that in the majority of cases the first changes that occur are repeated attacks of active cerebral congestion, followed by chronic cerebral congestion and chronic cerebral meningitis; and that, as the disease assumes a chronic form, the brain takes on a secondary change and becomes anæmic, atrophied, and indurated—a state allied to cirrhosis. In these cases of chronic meningitis proceeding to atrophy and induration—of which I have seen quite a number—the prominent symptoms have been impairment of memory, dullness of intellect bordering on dementia, trembling of the limbs, tottering gait, hesitating slurring speech, and other symptoms indicative of gradually progressing paralysis.

In making autopsies, where the cause of death has been owing directly or indirectly to the abuse of alcohol, I have found cirrhosis of the liver, fatty and waxy liver, cancer of the liver, chronic Bright's disease, cancer of the stomach, and cancer of the bladder, and, in one case a gummy tumor of the dura mater.* It is doubtless true that in many cases we shall find upon examination no pathological changes in the brain that are demonstrable by existing knowledge and appliances; but I think we should rather doubt the quality of our resources of observation than doubt the existence of pathological changes in this most delicate, sensitive, and complex of all organs when we have observed during life its functions to be obviously perverted, if not destroyed. Having endeavored to prove that dipsomania is a physical disease—that it is, in fact, a distinct type of insanity, I pass in conclusion to the consideration of the care of dipsomaniacs. Dipsomania, which I class as a periodic insanity, is more troublesome to manage than simple insanity, and requires, I think, a more perfect discipline both moral and physical than the latter.

In the treatment of inebriates we have primarily to build up and restore shattered constitutions and broken-down nervous systems. We have a class of patients to deal with whose digestive powers are weakened, whose appetite is impaired, whose muscular system is enfeebled, and whose generative function is often decayed; the blood is impoverished and the general nutrition disordered. They are indirectly predisposed to the acquisition of nearly all diseases, as they have, by long indulgence in alcohol, lessened the power of resisting

* This I consider as due to syphilis.

their causes. We have to deal with the results of a toxic poison, which has resulted in more or less pathological change in the brain and nervous centres. We have also to deal at times with various complications proceeding from the abuse of alcohol, such as cirrhosis of the liver, gastritis, epilepsy, various forms of dyspepsia, and in some cases with Bright's disease. We must place our patient under the most favorable hygienic influences, provide for him cheerful, tranquil, and pleasant surroundings, repress cerebral excitement, procure sleep for him, and an abundance of fresh air and exercise. A permanent recovery depends largely upon allowing sufficient time for restoration of nerve-power, mental tone, and physical vigor, and complete recuperation of the will-power. After a few months of systematic care, judicious restraint, and enforced abstinence from the occasion of temptation until the will-power has been restored, my patients have generally recovered and have been restored to society, and I have had a very gratifying degree of success in my treatment of dipsomania. We must stimulate inertia, resist every kind of perverted feeling, and check morbid impulses; and at last we may, if we exercise a wise care and discrimination, restore our patients to their homes and to society, permanently cured. In building up the system after the wonted stimulus has been withdrawn, which is invariably from the first, and in combating the nerve-exhausting tendencies which are always present in a marked degree in such cases, in addition to nerve sedatives and tonics, we have had surprising results from the use of electricity to the brain and spinal cord, and by its use we avoid the terrible nervous prostration, which, as it is well known, follows the withdrawal of liquor from an inebriate. Our patients who have applied in fear and trembling, dreading the ordeal they must pass through in the beginning of treatment by reason of such withdrawal, have been as much surprised as pleased to find the use of electricity supplied to the nervous system an agreeable and invigorating substitute for the stimulus which they were debarred from using, in such a marked degree that little or no suffering was experienced. As I have found that strychnia was a physiological antagonist to alcohol, I have used it largely and successfully in the treatment of dipsomania. I give from $\frac{1}{60}$ to $\frac{1}{32}$ of a grain, thrice daily, in combination with quinia and tincture gentian comp., so that my patient takes one or two grains of quinine before each meal with the strychnia. This makes a pleasant bitter tonic, and one under

which patients recuperate quickly. Further remarks on treatment will be continued at the end of this chapter.

The Causes of Premature Mental Decay and Nervous Exhaustion, induced by Dipsomania, and their Treatment.—Dipsomania as a disease will never, in common with other insanities, die out until the Anglo-Saxon race succeeds in producing, what it does not now produce, a physique and a brain capable of meeting successfully the demands that our climate and civilization make upon it. To do this requires a bringing up of the physical tone of the American women, so that the conformation shall be what it should be for the best propagation of the species, and that she shall have, what she has not to-day, the ability to furnish a suitable supply of wholesome nutriment for her offspring, as is the case with German, English, Scotch and Irish women. To-day the vital temperament is too predominant and too active, so much so as to require an undue proportion of the nourishment of the body. Nothing is more certain than that the physical development of most of our American women, differs very materially from the physiological standard upon which the true law of increase is based. The remedy for all this lies in the hands of the general family practitioners, and it is to the subjects of diet, fresh air, sleep and tranquillity of life of the young of the present generation, and to the general training of the young in educational institutions, that we must look for the production of a better type of physical and mental stamina. Parents should be taught that for their growing girls in high schools *more than two hours' study out of school* generally means weakened eyesight, headache, loss of physical vigor, loss of sleep and appetite, and disorders of menstruation. I think that the influence of physical culture, especially applied to women, and its influence on the body cannot be overrated, and that by due attention to this we shall see our young women graduating with health, with good muscular development, and an abundance of vitality stored up for the trying duties of maternity, and with the greatest possible harmony of action between the physical and mental organization, tending to good health, long life and healthy progeny.

Physiology points to the necessity among our American women of a better developed physical system, more evenly balanced in all its parts or organs, for a greater harmony in the performance of all their functions, especially in reference to what may not be termed the primary laws of nature, so that their children may not be weighed

down in the struggle of life with a defective organization, but be blest in the inheritance of a perfect anatomical and physiological structure in all its parts and organs, with a resulting harmony in the performance of all their functions, with perfect mental and physical health and immunity from the host of nervous diseases that affect so large a proportion of our people. It may seem as if an undue amount of attention is spent in the consideration of this question, but having, by reason of my specialty, devoted much time to the study and investigation of hereditary disease, I am firmly impressed that in order to eradicate dipsomania and allied nervous diseases, and to check the increasing tendency to physical degeneracy among American people, we must aim at the extirpation of radical defects in physical organization. At present the average number of children to each American family is steadily decreasing with each generation, and the children that are born exhibit a want of vitality, a want of stamina in the constitution, and such a predominant tendency to physical degeneracy as threatens seriously, it seems to me, the perpetuity of our native stock.

The pathology of the production of dipsomania, as well as most other nervous diseases, consists, primarily, in an interference with the proper nutrition of the cerebral tissues of the fœtus, so that even during embryonic life, the brain undergoes pathological changes, which induce deficient moral power, mental weakness and a predisposition to the acquisition of all forms of nervous disease, there being an ill-balanced and defective state of the whole central nervous system. These diseases would cease to exist if a true healthy civilization prevailed; but inebriety, in common with other nervous diseases, owes its origin to an artificial type, from wrong habits, pernicious customs and fashions, and from an unnatural culture and refinement where the laws of health and life are altogether too much violated. These diseases have not been the growth of one generation, but of many, and by the laws of inheritance have become greatly increased and the effects intensified. To eradicate these evils and to perpetuate the race as it should be, there must be sound and healthy stock, and not organizations impregnated from their very origin with the seeds of disease and premature decay.

We find in dipsomania the general symptoms of exhausted nervous power, viz.: general debility of the body, inability to walk even short distances without fatigue, general feeling of languor, unwillingness to make any active exertion, great tendency to sweat,

more especially at night, but also induced during the day by the slightest exertion, and often an unsteady gait. I have found these patients exceedingly prone to neuralgia. The explanation of this is probably due to the fact that there exists in such cases a warm, irritable, hypersensitive condition of the sensory nerve-cells of the central sensory tract, which is the sole seat of true nervous sensibility. The central nervous system is affected, beyond all doubt, by excessive drinking, and the degeneration thus produced, I regard as a powerful predisposer of neuralgia of the inveterate type. Aside from the direct influence impressed on the nerve-centres, I think that this irritable and hypersensitive condition of the central sensory tract is often induced by visceral irritative disease of the stomach, kidneys or liver, so frequently existing in inebriates, which almost necessarily affects the sensory nerves which ramify in these organs, and from these diseased nerves a more or less steady stream of irritative and wearing nervous impressions is transmitted, practically without cessation, to certain parts of the sensory tract, to which the sensory nerves from any given part may go, and as a result, sooner or later the central sensory nerve-cells are brought into that degree of nutritional disturbance which is the fundamental factor in neuralgia. The real seat of these severe neuralgias, from which so many dipsomaniacs suffer, is rarely, if ever, in the peripheral nerves of the affected region, but in the central nervous apparatus.

The heart's action is weak, often irregular, accompanied by palpitation, and not unfrequently with symptoms of indigestion. A change has also come over the man's mind, so that the very *morale* is changed. At one moment he may be very joyous and excitable, and then he will become greatly depressed. He will be very friendly and anon very hostile. He will be so obstinate that nothing can overcome his determination, and at other times you may lead him like a child. The heretofore ever ready and resolute man manifests marked indecision of character, and in other cases there may be an utter inability to fix the mind on any one subject, or to follow up a train of thought consecutively. Any force to cause permanent intellectual activity must be a mental and not a physical one. If the force be alcohol, which it often is, as it is becoming more and more the habit to resort to it for its temporary effects in this direction, the rate of interest paid for its use is frightful. Not alone is there a loss of tone in character and blunting of moral perception, but intellectual discrimination is much impaired, and impairment of all

the mental faculties is almost inevitable. The ideas are more spontaneous, less under the power of control and any exertion requiring continuous mental effort soon becomes impossible. There can be no doubt that alteration of the brain is taking place *pari passu* with these alterations of character. It may be atrophy, or the circulation through the encephalon may be checked or impeded by ossification or softening of the cerebral arteries, or some disease of the heart itself, or the neurine may be undergoing a change, particularly on its peripheral surface, as well as on the surface of its ventricles or cavities. The convolutions become paler and the furrows shallower. The weight of the whole cerebrum and cerebellum is lighter and less complex. Softening of a very delicate nature, so delicate as only to be detected post-mortem, by letting a little stream of water flow gently over the surface of the brain, may be taking place, or, what is very likely, and is often passed by unnoticed, because discernable only to a well-practised eye, which may not be present at the right moment for observing its attack, is a very slight fit of apoplexy and paralysis, so slight indeed, that it occurs and passes away unnoticed and unperceived, and is recognized only in its after-consequences and permanent effects. From such an occurrence, though loss of life does not ensue immediately, yet in its ultimate effects it is sooner or later fatal.

The patient is an altered man and never recovers himself. So delicate is the tracery of the nervous structure, that the damage of a single fibre or set of fibres destroys the unity of the whole. There are generally three things present that lead to these attacks of cerebral hæmorrhage, and as these attacks play a very important part in the production of premature mental decay in inebriates, it is desirable to thoroughly understand them and estimate their importance. The three things alluded to are hypertrophy of the left ventricle of the heart, chronic disease of the kidneys, and finally, degenerated cerebral arteries. The hypertrophy of the heart is a simple hypertrophy of the left ventricle, the wall of the ventricle being thickened without any dilatation, although in exceptional instances dilatation may ensue. The blood in inebriety is more or less noxious to the tissues, since it contains alcohol, and its passage into the capillaries is undoubtedly resisted by contraction of the small arteries, the vessels most rich in muscular tissue. The muscular coat of these vessels, therefore, is hypertrophied in antagonism to the heart. Since the small arteries are hypertrophied throughout the body, the

obstructions, though each is slight, are in their sum total so large, that in order that the circulation may be carried on efficiently, hypertrophy of the heart must ensue.

There may be, doubtless, degenerative changes in the small arteries, so that there is increased bulk with altered structure. It should not be assumed, I think, as it often is, that all the processes leading to cerebral hæmorrhage and apoplexy are of a degenerative origin, as there can be no reasonable doubt that the presence of alcohol sets up a condition of sub-inflammatory irritation, which plays a very important part in the production of cerebral hæmorrhage. The sub-inflammatory irritation causes the arteries to lose much of their elasticity and to become permanently wider, longer, and more tortuous. This absence of elasticity of the larger arteries, becomes by the withdrawal of the aid to the circulation in equalizing the flow of the blood, an important factor in leading to rupture of the smaller arteries. When the brain wastes slowly, as it often does, the dilatation of the vessels and the increase in the quantity of the cerebro-spinal fluid favors rupture very decidedly. There can be no doubt that the occurrence of cerebral hæmorrhage in inebriates, resulting from abnormal strains, would be much more frequent were it not for the provisions which nature has made for the protection of the brain from suddenly increased afflux. The turns of the carotid and vertebral arteries, the free anastomosis of the circle of Willis, and the small size of the arteries beyond that circle, before they enter the brain substance, all tend to protect the brain. The perivascular canals also exercise a protective influence over the vessels they surround, and in the corpus striatum, where cerebral hæmorrhage is especially liable to occur, as its vessels are not capillary in size and proceed from the middle cerebral artery, which is almost the continuation of the internal carotid, we find the perivascular sheaths of very large size. When I say, then, that I consider one of the principal causes, if not *the* principal cause of premature decay occurring in inebriates to be the occurrence of cerebral hæmorrhage, or apoplexy resulting from degeneration caused by the poisonous effects of alcohol upon the tissues, I do not think I overstate the actual facts. We generally have associated in such cases hypertrophy of the left ventricle of the heart, as I have previously remarked, chronic disease of the kidneys and degenerated arteries. The strong left ventricle and inelastic arteries combine to prevent the wave of blood sent to the arteries from being properly equalized, and consequently the smaller arteries

of the brain which are normally thinner than the arteries of other parts, and which are degenerated, receive the impulse from the heart's jerks, and being thus diseased and fragile—perhaps dilated and aneurismal—give way.

Before passing to the question of treatment I desire to briefly notice an interesting question, and one to which very little attention has as yet been directed. The question is that relating to *the degree of moral or criminal responsibility which attaches to inebriates.* Inebriety depends very frequently, as we all know, upon an abnormal organic development of the nervous system that has descended from generation to generation, gaining in intensity all the time. There must certainly be a modified responsibility when homicidal or suicidal acts are committed during periods of such abnormal cerebration. In such cases a criminal act may be committed in consequence of cerebromental disease without any apparent lesion of the perceptive and reasoning powers. In these cases, also, the mental disorder is of a sudden and transitory character, not preceded by any symptoms calculated to excite suspicion of insanity. It is a transitory mania, a sudden paroxysm, probably epileptiform in nature, in which convulsive activity is not reached except so far as the mind is concerned, without antecedent manifestations, the duration of the morbid state being short and the cessation sudden. In these cases the criminal acts are generally monstrous, unpremeditated, motiveless, and entirely out of keeping with the previous character and habit of thought of the individual. Such attacks are short in proportion to their violence. There is an instantaneous abeyance of reason and judgment, during which period the person is actuated by mad and ungovernable impulses. I would by no means wish to be understood as advancing the plea that inebriety as a simple habit should exempt or protect a man from the consequences of criminal acts committed while under its influence; but if he has unhappily inherited an abnormal organic development of the nervous system, so that mental delusion, weakness or disease deprived him of the power of choice, and if we can say, but for the presence of these morbid conditions, the habit never would have been formed, we should then look upon his inebriety as due to mental disease, and hold him responsible accordingly. In dipsomania we have a true, uncontrollable, and intermittent impulse to take alcohol to intoxication, an irresistible impulse which differs entirely from the physiological state in which an individual merely chooses to indulge in liquor to excess. The first is periodic, the

second a daily habit; the first is a *disease*, the latter a *bad habit*. If we in each individual case study up its psychological history we shall always be enabled to cure.

I knew a very prominent lawyer who about once in four or five months would drop his most urgent cases and remain away from home for days, to gratify the irresistible impulse to drink, which periodically seized him, and made him regardless of every consideration of business or family ties. No one deplored this disease more than the patient himself, and no one was more anxious than himself to be cured if such a thing were possible. By my advice he relinquished his business, put himself under treatment, and at the end of six months returned to his professional duties a well man, and has never suffered from a relapse, as his will-power which had been utterly destroyed was restored, and he avoided even the most moderate use of alcoholic liquors, and continues to do so to the present day. His dipsomania was the result of a family neurosis and of hard brain-work and consequent brain exhaustion, with too little sleep to renovate his nervous system. I regard this as a case of true periodic mental disorder, just as much as if his disease had been a mania instead of a dipsomania. Dipsomania is not a rare disease in young married women residing amid the excitement of large cities. Nervous exhaustion, produced by sexual excess, and too rapid child-bearing, plays, I think, an important *role* as the exciting cause of the dipsomania, in these cases, which admit of a prompt cure if the patient be removed for a few months from her home and placed under judicious medical care. If in any given case I can prove to you that an inebriate who has committed some criminal act during one of his paroxysms, has had a paternal or maternal ancestor in an insane asylum, I certainly present to you a strong reason for pausing before you denounce the act as the simple outgrowth of a vicious habit.

Again, if a man has committed an act prejudicial to himself and others, during a paroxysm of dipsomania which has appeared either in very early youth, or in old age, after a long, virtuous, and temperate life, or after a sudden mental shock or sunstroke, I at once negative to your minds the hypothesis of habitual drunkenness.*

* The profession should understand that this disease menaces, necessarily, not our lowest but our highest civilization. It is the most brilliant class of men, our great thinkers, men of great mental activity, with whom, as Dr. Wright of Ohio has shown, the anæsthesia attending the use of alcohol blunts and assuages the too acute sensibilities of their nerves. It affords rest to the overtaxed mental faculties, he says, and moderates

A very interesting case from a medico-legal point of view occurred a short time since, in which the writer was consulted as an expert. A murder was committed by a man under the influence of a small quantity of stimulus, which evidently induced a state of temporary insanity, or an epileptiform attack. The integrity of the brain had been affected by a previous sunstroke, and the man had just recovered from quite a serious illness. It is well known that after a sunstroke a small quantity of liquor acts very violently upon the central nervous system, and it might, therefore, be argued that he was responsible for the voluntary act by which he submitted himself to the influence of the intoxicating liquors. But the facts of the case were that, previous to this time, he had been accustomed to drink with impunity, far more than upon this occasion and had never before been intoxicated. The man was, therefore, in a morbid state produced by the sunstroke, subject thereby to a tendency to insanity, liable to be excited by alcohol, of which morbid state he was ignorant, having had no reason, from his past experience, to believe that such results were likely to proceed from a small quantity of alcohol, and with no intention in his mind to do more than take a very small

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those excessive sensibilities whose ceaseless activity forces the mind to unresting labor. Dr. Wright well delineates that the men who are threatened with this disease, and become victims to it, are the neurotic thinkers, the men, who, from the constitutional debility of their inhibitory nervous faculties, cannot control the limits of their mental activity. My friend, Dr. Joseph Parrish, has truly said that "the fact that there is a condition of the nervous system with which some men are born, that predisposes them to seek alcoholic indulgence, is too well known to admit of successful contradiction." In an address last April before the "American Association for the Cure of Inebriates," on the "Pathology of Inebriety," I called attention to the fact that it is a disease exhibiting certain essential, psychic and physical signs; a disease in which the victims are all more or less irresponsible as are the insane; a disease in which the tone and power of the nerve centres is lost. A disease perhaps more than any other excepting insanity requiring for its cure, time and long persistent hygienic influences to restore the normal vaso-motor condition, affecting the nutrition and circulation of the brain and nerve centres. Normal mental function depends upon cerebral cellular health. Dipsomania is eminently a disease depending upon cellular and molecular unhealth and it is this abnormal condition of the centric nervous system, demanding stimulants, that is essentially the disease. Those who are affected by this disease generally have an inherited neuropathic constitution and exhibit certain neurasthenic symptoms which are the early, curable, prodromic symptoms of inebriety. They are functional disturbances of the whole bodily organism. There is relaxation of the general muscular tone, cardiac stimulation and palpitation, local tremor, and respecting cerebral actions, the characteristics of debility of brain due to general failure of the normal nutrition appropriating power of the brain, such as morbid fears and dreads, morbidly colored perceptions, conceptions and misconceptions and a timidity, irresolution, and general irritability—all foreign to a healthy person and constituting the essential psychic signs of the neuropathic conditions of inebriates.

quantity of stimulus. As you will see, in this case it seemed the only proper way to hold this man responsible for consequences which an ordinary understanding could recognize as likely to follow from immediate acts. I gave it as my opinion that the murder, which I will presently describe, was committed during a transitory state of *moral epilepsy*, which was the result of a preceding sunstroke, the immediate exciting cause being an attack of illness and the taking of a small quantity of alcoholic stimulus. This state of "moral epilepsy" is a morbid affection of the mind centres, which destroys the healthy co-ordination of ideas, and occasions a spasmodic or convulsive mental action. The will cannot always restrain, however much it may strive to do so, a morbid idea which has reached a convulsive activity, although there may be all the while a clear consciousness of its morbid nature. The case just alluded to had complained of pains in the head and sleeplessness, which had displayed marked periodicity, and which had been accompanied by great irritability of temper, excited by trifles, and seemingly unconnected with personal antipathies. As has been previously stated, the person alluded to had been suffering from quite a severe illness and, after taking a small quantity of alcoholic stimulus, went out to walk. He met a friend with whom he had been familiar for years, and a discussion arose as to the respective merits of certain politicians, when, the discussion becoming excited, the man drew a revolver and shot his friend. He then went, in a dazed and confused state, and sat for some hours upon a river dock, and subsequently went home, burst into tears, and informed his wife of the sad occurrence, and gave himself up at the police station. There was no simulation of insanity by pretending to be incoherent or by strange actions, and no attempt either on the part of himself or wife to pretend that the act was an insane one. There was, however, a total blank in the prisoner's mind respecting the events immediately preceding the pistol-shot, which shot seemed to have aroused his attention for the time, and he had no recollection of the fact that he sat on the dock for some time afterwards, as he was seen to do. Upon being consulted, as I have stated, I gave it as my opinion that there had existed, for months previous to the occurrence, a profound or affective derangement which, from its marked periodicity, was evidently epileptiform in character, and that the sudden homicidal outburst supplied the interpretation of the previously obscure attacks of sudden derangement. There had evidently been induced by the sunstroke in this case an

epileptiform neurosis, which had been manifesting itself for months, chiefly by irritability, suspicion, moroseness, and perversion of character, with periodic exacerbations of excitement, all foreign to the man previous to the attack of sunstroke. There are a great many instances among dipsomaniacs where, in an unconscious condition, persons progress from odd or eccentric actions to deeds of violence, suicide, or murder, being unable to remember the circumstances afterwards, and, therefore, irresponsible for their actions. The question as to the degree of mental responsibility attaching to such cases is one of great interest to psychologists and also to jurists, and one to which it is hoped in the future much more attention may be directed than in the past.*

Treatment.—In the treatment of nervous exhaustion and premature mental decay arising as the result of dipsomania, we should primarily direct our attention to the direction of the mental habits. We should endeavor to provide constantly easy and pleasant occupation of the mind, avoiding equally lazy inaction or violent excitement. We have in these cases to deal with a worn, irritable condition of the nervous system—an unstable condition as regards its nutrition, its solidity, and its perfection of structure, which makes our task no light matter. We must be very careful that we make our patients sleep, or we shall have a preponderance of waste over

* We are very much behind the age in our medico-legal views of inebriety. Mittermaier, in 1840, in the *American Jurist* for July, has been found by my friend, Dr. T. D. Crothers of Hartford, as enunciating sound and scientific views respecting the legal responsibility of inebriates. Of course it is perfectly evident to any unprejudiced mind, that any disease in which there is abnormal cerebration, and an abeyance of reason and judgment, where the patient is deprived, by disease, of the power of self-control and choice produces a limited responsibility. The healthy coördination of ideas is destroyed exactly as in any other phase of mental disease. The late Dr. Beard and Dr. Crothers have preferred the term "trance state" to the condition I have termed "epileptiform," in which a person may be in apparently full possession of his senses and yet be as unconscious as if in a somnambulistic state.

In true trance, however, volition is lost and there is complete abeyance of the mental functions. I explain this condition of abnormal psychical process in inebriates by which intelligence and thought seem temporarily paralyzed, and consciousness suspended, by the sudden establishment of an irritative lesion caused by vascular tonus of the arterioles of both motor and sensory zones of the cerebral cortex, causing such commotion or perturbation of the centres in general that their functions are for the time partially suspended. We get a paralysis or incoördinate action of these movements, special senses and ideas, the centres of which in the brain the lesion invades. Being only functionally suspended they again resume their functions and the normal equilibrium is restored after a variable period. Strychnia in $\frac{1}{3}\frac{1}{2}$ to $\frac{1}{2}\frac{1}{5}$-gr. doses is the best physiological antagonist to this state of vascular tonus of the arterioles of the brain in inebriates.

repair that will balk all our efforts. Our patients, by reason of the hereditary factor generally present, cannot, without great danger to themselves, do or endure what other patients might safely do. It will be also necessary to supply the greatest amount of nutritive material to the brain to repair the undoubtedly existing nutritive lesion. In some cases I have given protagon with good results, and in others the acid phosphates, with free phosphoric acid, in the form devised by Dr. William Pepper, of Philadelphia. It has seemed to me to supply nerve force and to restore enfeebled digestion very excellently in dipsomania. I have also used a preparation of cod-liver oil with the wheat phosphates with good results. We must quiet all abnormal nervous excitability and keep our patients calm and tranquil. Attention should be paid to the condition of the excretory functions of the skin, kidneys, and bowels. If there is headache and drowsiness such diuretics as the liq. am. acetat., with spt. æth. nitr. are indicated. The ext. of cannabis indica has also proved itself, in my hands, a valuable adjunct in doses of one-quarter grain of the solid extract. Free exposure, without fatigue, to the fresh air cannot too strongly be insisted upon. One of the most valuable remedial agents is phosphorus, which I prescribe to be administered in cod-liver oil in doses of from $\frac{1}{100}$th to $\frac{1}{120}$th of a grain, after meals. The cod-liver oil is one of the best nutritive remedies, as fat must be applied to the nutrition of the nervous system if this is to be maintained in its organic integrity. The general effects of phosphorus are those of a stimulant, but it possesses a special power over the exhausted nervous system. It is, perhaps, evanescent in its effects, but is never followed by a stage of depression which is noticeable. It should never be ordered on an empty stomach. I have used the phosphorized elixir of calisaya bark with strychnia in many cases of dipsomania with good results. As I have previously remarked, I regard strychnia as a very valuable nerve tonic in dipsomania, as it seems to me to antagonize the effects of alcohol upon the system. Quinine is also very valuable. I have also obtained excellent results from the use of phosphide of zinc, grains $\frac{1}{10}$th, in combination with the ext. of nux vomica, in $\frac{1}{4}$-grain doses.* When there is persistent insomnia I am accustomed to rely upon the use of prolonged warm baths, given at bedtime, conjoined, when necessary, with the use of the monobromide of camphor in doses

* Oxide of zinc in 2-grain doses ter die in alcoholic insanity is extremely valuable, inducing healthy molecular action in the brain.

of 4 grains. I always use the imported preparation (Dr. Clin's capsules). This admirable therapeutic agent is one of the most valuable remedies we possess in treating hysterical mania, it should be given in 4-grain doses, t. i. d., being careful to order the imported article, which comes from Paris. The chloro-phosphide of arsenic (Routh's formula) is a very valuable therapeutic remedy to antagonize the condition of brain-wasting which often threatens our patient suffering from the nervous prostration induced by dipsomania. It should be given in 5-minim doses, after meals, and gradually decreased till, at the end of six weeks, the patient is taking but 1 minim thrice daily, which he can continue for one week more, and then drop entirely. I come finally to speak of the remedial agent which, in my opinion, far surpasses all others in its permanent effects, and which is comparatively little used. I refer to the judicious use of the constant and induced currents of electricity. The essential difference in the action exerted upon the nervous system by the use of electricity and that produced by drugs very often prescribed is as follows: Many of the remedies commonly employed in the treatment of nervous diseases and in dipsomania, for the purpose of restoring lost nerve-force, are *nerve stimulants*, and not nerve tonics in the proper sense of the term.

Electricity is a remedial agent which furnishes us with the means of modifying the nutritive condition of parts deeply situated, and of modifying the circulation to a greater extent, I think, than by any known agent. By the judicious employment of the constant and induced currents, we have it in our power to hasten the process of nerve-growth and nerve-repair, and thereby indirectly hasten the acquisition of nerve-power. The use of electricity does not, I think, act by contributing anything directly to the growth or repair of nerve-tissue. Its action, it would seem most probable, is to stimulate and quicken those processes on which the material and functional integrity of the nervous system depends. The action of electricity is always followed in my practice by an increase of strength and nerve-force, and the results gained are gradual and permanent; while the use of nerve stimulants has always seemed to me to primarily excite the nerve activities proper, and *not* the nutritive processes upon which the acquisition of power depends. The deceptive results obtained from the use of nerve stimulants, depends upon the excitation of nerve activities and the resultant expenditure of nerve-power, which is followed by a period of exhaustion, varying in degree and duration.

The careful use of electricity has always led in my hands to an increase of nervous energy, while the employment of nerve stimulants has appeared to me to lead, in many instances, ultimately to a waste and diminution of nervous energy. In cases of dipsomania we have, as I have already remarked, abnormal nervous excitability conjoined with cerebral exhaustion, and the two indications which are urgent are, primarily, for increased rapidity and effectiveness as regards the process of nerve nutrition; and, secondarily, to secure freedom from excitement and diminution of nerve activity, and thereby to check the waste of nerve structure and of power. These indications we can fulfil by the judicious use of electricity and nerve-tonics more certainly than by any other means, there being no other such combined sedative, restorative and refreshant, to the central nervous system, and we can thus successfully meet all the indications in cases of cerebral exhaustion and threatened mental disease, except that of affording direct nutriment to the brain, which, as I have before stated, I endeavor to obtain by rest, cod-liver oil, phosphorus, etc. The use of electricity seems to supply to the nervous system, in cases of inebriety, the stimulus which has been withdrawn, my patients having repeatedly told me that, while under treatment, they experienced little, if any, of the terrible feelings produced by its withdrawal under ordinary circumstances. I have seen this so often that I advance it as a proven scientific fact, and not as an untested theory. I have generally used both currents, the constant and the induced; in the former case using the negative electrode at the pit of the stomach, and, in the latter case, placing the negative electrode at the lower end of the spine, in both instances applying the positive pole to the crown of the head; cervical sympathetic nerve, reached by passing the electrode down along the anterior border of the sterno-cleido-mastoid muscle in neck; the cilio-spinal centre, or region over or on each side of the seventh cervical vertebra; and up and down the spine, making a séance of perhaps fifteen or twenty minutes daily, and in some cases twice a day. This adds very much to the trouble of caring for these cases, as it requires much time and patience on the part of the physician, but the results obtained amply repay one for the extra time expended. I have obtained such excellent results from its use that I hope other physicians, presiding over institutions similar to mine, may be induced by my success to give this very important remedy an extended trial, after which I feel sure that they will never willingly relinquish so effective an agent.

CHAPTER XX.

HYSTERIA.

Anything that weakens a woman generally may, by altering the relation of the several nervous functions, bring about the condition of nervous disturbance known as hysteria. Our women are the more readily becoming hysterical by reason of the absence of a *physique* and stability of nerve-tissue capable of meeting successfully the demands that our climate and civilization make upon them. The vital temperament is deficient in the American woman, and the nervous temperament is too predominant and too active, so much so as to require an undue proportion of the nutrition of the body. If we are to avoid an aggravated type of hysteria in the girls of the rising generation, we must, by great and continual attention to the subjects of diet, fresh air, sleep, and tranquillity of life of the young endeavor to produce a better type of physical development and mental stamina. What is especially needed is a greater harmony between the physical and mental organization. Our American women need a better developed physical system, more evenly balanced in all its parts or organs, with a greater harmony in the performance of all its functions. The principle characteristics of hysteria consist in an exaggeration of involuntary motility and a diminution of the power of the will. The voluntary movements are not properly executed, while the reflex, sensational, and emotional movements are abnormally active. The will is determined by the ideas, feelings, and fancies. There is a malnutrition of the nervous system, so distinct that the higher functions are impaired. The lower functions exhibit increased activity, while the higher exhibit diminished power. Hysteria is pre-eminently a disease of females, and is induced by want of occupation, real or fancied, morbid states of the reproductive organs, conflicting emotions, disappointed affections, late hours, and unhealthy and perverted manner of life. It is sometimes met with in males as the result of over-mental work, worry, and excitement, or dissipation. Hysteria appearing in women generally comes on, for the first time, between the age of commencing puberty and twenty-five years. It may, however, come on at any time during the life of the individual.

Of the cases that have been under my treatment, I have traced emotional disturbance as the principal cause in the production of the

hysteria, and the majority of the cases that I have had under treatment have been young unmarried women. I have found the ovaries involved more often, also, than the uterus. The evidence of this may be found in the fact that they are painful upon pressure. The mental condition of a woman affected with hysteria is somewhat peculiar. The patient, when the hysterical feelings come upon her, does not feel disposed to make the slightest effort to resist them, and yields to her emotions whatever they may be. She will laugh or cry on the slightest provocation, and is very nervous and excitable. She cares nothing for her duties and seemingly takes pleasure in exaggerating all her slight discomforts and annoyances, and by her suspicious, exacting and unreasonable behavior makes life generally uncomfortable to those about her. She indignantly resents all attempts and efforts for her comfort and cure, and discards all advice from her best friends, but will eagerly listen to the counsel of the many friends who come in to pity, sympathize and condole with her. She will say that for her to do certain things is absolutely impossible, but under the stimulus of strong desires or wishes, will, if unobserved, do precisely the things declared to be impossible. I have repeatedly known hysterical women under the influence of a dominating idea, to undergo severe fatigue, and even privation, that a healthy person would find most arduous and difficult of accomplishment, and upon my next visit, the same person would declare that the slightest effort to move her limbs was excruciatingly painful. I have also had patients declare that they were suffering the most frightful neuralgia, and exactly simulate a neuralgic attack of great severity, although the placid countenance and expression of the mouth was a convincing proof to the contrary. As a rule, I have observed no marked disturbance of the menstrual functions, although my patients generally attribute a very undue prominence to them when stating their cases to me. I have also failed to see that hysteria in women could be traced to sexual excess. One of the earliest symptoms of hysteria is a condition of hyperæsthesia or exalted sensibility. All the senses seem to be preternaturally acute,—hearing, sight, smell and taste. Patients also complain of pain, which they locate on the top of the head, in the mammary region, the hypogastric or sacral region or in the various joints. It is a noticeable fact that, although a slight touch on the joints is much complained of, that pretty active motion will be borne without discomfort. Hysterical anæsthesia I have also found existing in the same instances. As regards

the muscular system, we may find an increase of involutary muscular activity and a diminution of the voluntary movements.

We find at times in hospital patients, partial paralysis of the various limbs. Thus the leg or arm will appear to be paralyzed, or the patient will feign paraplegia, and she generally watches very carefully the effect of her performance upon the bystanders. Such a patient will tumble down and recover herself as a paraplegic patient could not do. The nutrition of the affected limbs does not become impaired as it does in actual paralysis, and as a rule there is unimpaired electric sensibility and contractility. We may find indefinite disturbances in all parts of the body. The general health may be good, and the body very well nourished, or there may be a condition of ill health and general delicacy.

The disturbances of digestion are generally traceable to a foolish diet and an excess of stimulants. This excess of stimulants not unfrequently in cases coming under my care from the higher classes of society, has gradually led to dipsomania, which exists at the time the patient comes under treatment, and requires to be combatted and cured. Excessive indulgence in opium especially in the form of morphine, to the extent of the opium habit, I have also seen several times complicating the state of hysteria. In the hysterical convulsions which occur, there is no sudden loss of consciousness. The patient will inform her nurse or whoever is near that she "is going to have a fit," and a general theatrical effect follows. There is no distortion of the features as in epilepsy, neither is there dilatation of the pupil. The eyelids quiver, and the patient sees and often watches the effect of her "fit" upon her friends or attendants. There may be foaming, but the tongue is not bitten unless purposely to deceive the physician, as I knew one patient to do. The patient often utters a loud scream as she falls, but is very careful to fall so as not to hurt herself.

The presence of the hysterical aura, commencing often in the iliac region, spreading to the epigastrium, causing nausea or vomiting; to the chest, causing palpitation of the heart; to the throat, giving rise to globus hystericus; and finally to the head where it induces noises in the head, dimness of vision and clavus: generally precedes the hysterical convulsion, and serves to distinguish between it and the epileptic convulsion. The larynx and air passages may be involved to the extent of aphonia and dyspnœa. Very often there is a loud barking cough which has a very characteristic sound. The uri-

nary organs may be affected, and we may find either retention of urine or a large secretion of pale limpid urine. As regards the reproductive system I have found, as I have remarked, that many hysterical women are quite free from menstrual disorders. We may, however, find amenorrhœa, dysmenorrhœa, menorrhagia and other menstrual troubles. Hysteria as a nervous disease of the brain may appear in children, and is a general psychoneurosis with them. Its principal predisposing cause in children is a nervous constitution or temperament, while the most important exciting cause is disturbance of the sexual organs. It is hereditary and comes from parents and grandparents. It depends on the mental and bodily education of the child. Physical disturbances, such as bad treatment, fright or fear, are excitants. Also, overstraining of the mind at school, and a very important exciting cause is seeing other children in hysterical attacks. The questions in diagnosis are whether the child is predisposed to hysteria, and whether there is any good reason for simulation. The general prognosis is not good, as the symptoms tend to increase at puberty, and the severest forms of hysteria in adults I have traced back as beginning in childhood. We have completely developed hysteria occurring both in boys and girls many years before puberty. It is rare, however, and the ground for it may be anæmia, chlorosis or hereditary nervousness. As to the treatment of the hysteria of childhood, the symptoms may disappear under a purely psychical treatment, but we must look to the general constitution and build it up with protocarb. of iron, associated with other tonics, good diet, fresh air, cold sponge baths with friction, and remove all predisposing and exciting causes. We must look out for habitual headaches in school children, as they lead to poverty of blood, loss of cheerfulness and mental vigor, and we may get trophic changes in the ganglion cells of the brain cortex, caused by anæmia and passive dilatation of the cerebral bloodvessels and consequent stasis.

Closely allied to hysteria are the nervous disorders dependent upon a morbid condition of emotion, of idea and emotion, or of idea alone. Dr. J. Russell Reynolds has shown that some of the most serious disorders of the nervous system, such as paralysis, spasm, pain and other altered sensations are thus dependent.

These symptoms, he says, often exist for a long time, appearing as complicated diseases of the brain or spinal cord. They resist many different kinds of treatment, and are alike unaffected by sedatives or irritants, by attention or neglect, and disappear entirely upon

the removal of the erroneous idea. They occur independently of hysteria, and are often associated with debility. They are also sometimes associated with real disease of the nervous centres, so that the practitioner may be perplexed to know how much of a given case is due to organic lesion and how much to morbid ideation. He cites the acute effects of idea and emotion as appearing in the case of the butcher who was agonized almost past endurance by the fact that a flesh-hook had caught itself, not in his skin, as he thought, but only in his sleeve. He says very truly that we often overlook the "chronic" effects of idea and emotion when they take the form of muscular and sensory disturbance. The case of a young lady is cited, who was admitted into his London Hospital with paraplegia. She had become so gradually, and had lost flesh generally and to a considerable extent. For two or three months she had been quite unable to stand even for a moment, and upon her admission lay in bed almost entirely. She thought she might get better. The paralysis was quite complete; she could just move her toes or raise either heel separately from the bed, while lying on her back. There was, however, no want of control over the sphincters, no local change of nutrition, the cutaneous sensibility was perfect, the electric contractility and sensibility were perfect; there was no spasm either tonic or chronic; there was no pain either spontaneous or producible by movement of limb or pressure on the spinal column, there was no evidence of tubercular or other cachexia, there had been no blow, and there was no hysteria. Dr. Reynolds did not consider that this case could be placed under any of the forms of spinal disease, and he diagnosed it as ideal paralysis.

Her father had become paralytic suddenly, and she had nursed him carefully, had worked hard and constantly with the idea of paralysis constantly on her mind, and as her limbs often ached from weariness and her brain was tired, she became possessed with the idea that she might become paralyzed like her father. She gradually lost power in her legs, and finally was carried to the hospital. She was told confidently that she would soon be well, and was given a mild tonic and—merely for the mental impression as the electric contractility was perfect—faradization of the legs. Her back and limbs were rubbed and she was taken between two nurses, who acted as crutches, and was walked five minutes every four hours. The second day after treatment was commenced she could stand with a

little support, at the end of four days could walk fairly well, and at the end of a fortnight was as strong and well as ever.

Another case fifteen years of age, had been "paralyzed" for two years, after typhoid fever. She was thin, but bright and merry. She had never been hysterical. She was partially hemiplegic. Could not stand a moment. Her legs would double up under her, and she would drop upon her knees. When lying on her back she could draw her knees upward briskly and strongly. She could throw the foot down with vigor and could move along the floor briskly on her hands and knees, dragging the legs after her, with the feet turned downward and the toes inward. The sensibility and electric contractility were perfect everywhere. She was put on mild tonics, the legs were faradized for the mental impression, and she was walked between two nurses for five minutes every few hours. In one week she could walk well with no assistance.

Those patients whose symptoms are the result of idea or imagination believe utterly in the reality of their symptoms, and will follow out earnestly any plan of treatment, when in genuine hysteria the patient often wishes to and actually deceives those about her. These apparently absolute paralyses co-exist with perfect sensibility of skin, electro-muscular sensibility and contractility, with unimpaired nutrition of the muscles and the skin, and with no sign of disease in the spinal bones, and in treatment, while we may get no result from ordinary therapeutics, we get immediate cure when we adopt methods which are directed to the alteration of the patient's ideas. We must make such patients walk at once, at stated periods, with support on each side, this support to be diminished day by day. We must use faradization of the muscles of the limbs for its mental effect on our patient's mind, and make those muscles contract vigorously which the patient uses least. Massage and friction of the limbs may also be used, and we can always get prompt cures in these cases.

I have found a very interesting letter from London, written in the year 1680, by Dr. Thomas Sydenham, on hysteria, and it is interesting to see that even at that early day Dr. Sydenham recognized the existence of hysteria in men. I think the description can hardly fail to be of interest, and before proceeding to the question of treatment I accordingly insert the most interesting parts of this letter.

"This disease, if I calculate right, most frequently occurs of all chronical diseases; they are half the chronical diseases. For very few women, which sex is the half of grown people, are quite free from every

assault of this disease, excepting those who, being accustomed to labor, live hardly; yea, many men that live sedentary lives, and are wont to study hard, are afflicted with the same disease. And though hysteric symptoms were heretofore supposed to come from a vicious womb, yet if we compare hypochondriac symptoms, which were thought to proceed from obstructions of the spleen or bowels, or from some other I know not what obstruction; an egg is scarce more like an egg than these symptoms are to one another in all respects. But it must be confessed that women are much more inclined to this disease than men, not because the womb is more faulty than any other region of the body, but for reasons to be shown hereafter. Nor is this disease only frequent, but so strangely various that it resembles almost all the diseases poor mortals are inclinable to; for in whatever part it seats itself it presently produces such symptoms as belong to it; and unless the physician is very skilful, he will be mistaken and think these symptoms come from some essential distemper of this or that part, and not from any hysteric disease. For instance, sometimes it possesses the head, and causes an apoplexy which also ends in an hemiplegy, and is exactly like the apoplexy whereby corpulent and old people are destroyed; and which happens because the animal spirits are stopped, the cortex of the brain being stuffed by a great deal of phlegm; from which cause the apoplexy of hysteric women does no way seem to arise; for it seizes such very often presently after delivery, a great quantity of blood being at the same time evacuated; or it proceeds from hard labor or some violent commotion of the mind. Sometimes it occasions violent convulsions much like the falling sickness; the belly and bowels swelling towards the throat, the sick struggling so violently, that though at other times her strength is but ordinary, she can now scarce be held by all the strength of those that are about her, and she mutters some odd and inarticulate sounds and strikes her breast. Women that are wont to have this disease, commonly called mother-fits, are generally very sanguine, and have a habit of body almost like that of a *virago*. Sometimes it seizes the outward part of the head between the pericranium and skull, causing violent pain continually fixed in one part, which may be covered with the top of your thumb, and violent vomiting accompanies this pain. I call this kind *clavus hystericus*, chiefly affecting those that have a chlorosis. Sometimes falling on the vital parts, it causes so great a beating of the heart that the women who are troubled with it verily believe that

those that are near may hear thumping on the ribs. This kind chiefly seizes those that are of a thin habit of body and of a weak constitution, and who look consumptive, and also young virgins that have the green sickness.

"Sometimes it seizes the lungs and the patient coughs almost without intermission, but expectorates nothing, and though this sort of cough does not shake the breast so violently as that which is convulsive, yet the explosions are much more frequent. But this kind of hysteric cough is very rare, and chiefly invades women that abound with phlegm. When this disease seizes on one of the kidneys it plainly represents, by the pain it causes there, a fit of the stone, and not only by that sort of pain and by the place it rages in, but also by violent vomitings which accompany it, and also for that the pain sometimes extends itself through the passage of the ureter, so that it is very hard to know whether these symptoms proceed from the stone or from some hysterick disease, unless, perchance, some unlucky disturbing of the woman's mind a little before she was taken ill, or the vomiting up of green matter shows that the symptoms rather proceed from an hysterick disease than from the stone. Neither is the bladder free from this false symptom, for it not only produces pain there, but it also stops the urine just as if there were a stone, whereas there is none. But this last kind, seizing the bladder, happens very seldom, but that which resembles the stone in the kidneys is not so rare; both are accustomed to invade those women who are much weakened by hysterick fits coming frequently, and whose health of body is much impaired. Sometimes, falling upon the stomach, it occasions continual vomiting, and sometimes a diarrhœa when it is fixed upon the guts, but no pain accompanies either of these symptoms, though frequently in both the green humour appears. Both these kinds are familiar with those that are much weakened by the frequent coming of hysterick fits, and as this disease afflicts all the inward parts almost, so sometimes the outward parts are also seized by it, and the musculous flesh, occasioning pain, and sometimes a tumor in the jaws, shoulders, hands, thighs, legs, in which kind the tumor which swells the legs is more conspicuous than the rest; but whereas, in hydropsical tumors, these two things may be always observed, namely, that the swelling is most in the evening, and being pressed by the finger a pit remains. In this tumor the swelling is most in the morning; neither does it yield to the finger, or leave any mark behind it, and for the most part it only

swells one of the legs. As to other things, if you observe the largeness of it, or its superficies, it is so very like hydropsical swellings that the patient can scarce be persuaded to believe that it is any other disease. Neither are the teeth, which you will scarce believe, free from the assault of this disease, though they are not hollow and though there is no apparent defluxion that may occasion the pain, yet it is no whit gentler, nor shorter, nor easier to be cured. But those pains and tumors that afflict the outward parts chiefly fall upon those women that are in a manner quite destroyed by a long series of hysterick fits and by the force of them. But among all the torments of this disease there is none so common as a pain in the back, which most certainly all feel how little soever they are afflicted with the disease. Moreover, this is common to the above-mentioned pains, that the place on which they were cannot bear touching after they are gone, but is tender and aches just as if beaten soundly; but this tenderness goes off by degrees. And this is worthy of observation, that often a notable cold of the external parts makes way for these symptoms, which, for the most part, goes not off till the fit ends, which cold, I have observed, is almost like that by which a carcase grows stiff; and yet the pulse is good. And, moreover, almost all hysterick women whom I have taken care of hitherto complain of a dejection and sinking of the spirits, and when they would show the place where this contraction or sinking of the spirits is, they point to the region of the lungs. *Lastly*, it is known to every one that hysterick women sometimes laugh excessively and sometimes cry as much without any real cause for either. But among all the symptoms that accompany this disease this is the most proper and almost inseparable, viz.: an urine as clear as rock-water, and this hysterick women evacuate plentifully, which I find, by diligent inquiry, is in almost all the *pathognomonick* sign of this disease which we call hysterick in women and hypochondriack in men; and I have sometimes observed in men, that presently after making water of a citron color (yea, almost the next moment), being suddenly seized with some violent perturbation of the mind; they presently void water as clear as crystal and in great quantity, with a violent stream, and continue ill till the urine comes to its wonted color, and then the fit goes off.*

* Within a week I have been consulted by an eminent Southern physician for relief of his nervous symptoms, and the most prominent of them all was a sudden, violent gush of pale, limpid urine, in large quantity, whenever anything disturbed his mind. He was

"And it happens to all hysterical and hypochondriacal people when the disease has been long upon them, that sometimes they belch up ill fumes as often as they eat, although they eat with moderation and according as they have an appetite; and sometimes the wind that comes from the stomach is sour, just like vinegar, when it comes into the mouth, the concoction being much decayed and the juices quite changed from their natural state. Nor are they unhappy on this account, viz.: that their bodies are so disordered and, as it were, tottering like ruined houses, for their minds are worse affected than their bodies, for an incurable desperation is mixed with the very nature of the disease. They are very angry when any one speaks ever so little of the hopes he has of their recovery, easily believing that they undergo all the miseries that can befall a man, foreboding the most dreadful things to themselves; entertaining in their restless and anxious breasts, upon small occasions and perchance for none at all, fear, anger, jealousies, suspicions, and worse passions of the mind, if any can be worse; abhorring all joy, hope, and mirth; and if any of these chance to happen, 'tis very rare and soon flies away, and yet does not less disturb the mind than the sorrowful passions; and they never keep a Mean—constant only to inconstancy. Sometimes they love above measure and presently hate the same without any reason. Sometimes they intend to do this or that, and then presently alter their intentions and begin quite the contrary, and yet they do not do that either; so wavering are they that their minds cannot be at all at rest.

"A day would scarce suffice to reckon up all the symptoms belonging to hysterick diseases, so various are they and so contrary to one another that Proteus had no more shapes nor the chameleon so great variety of colors, and I think Democritus was pretty right (though he mistook the cause of the disease) when he wrote in an epistle to Hippocrates that the womb was the cause of six hundred miseries and of innumerable calamities. Nor are they only very various, but also so irregular that they cannot be contained under any uniform type, which is usual in other diseases, for they are, as it were, a disorderly heap of phenomena, so that it is very hard to write the history of this disease," etc., etc.

From this interesting account given by Dr. Sydenham, in 1680, of the symptoms of hysteria, we see that, in many respects, it was

suffering from what an eminent authority had diagnosed as congestion of the spinal cord but which was decided hysteria and hypochondriasis.—E. C. M.

pretty well understood even at that early day. Dr. Sydenham evidently considered hypochondriasis and hysteria as identical, whereas we know now that the former has for its chief manifestation *mental depression*, occurring without adequate cause, and our hypochrondriac patient believes that he is the victim of some organic disease, and, furthermore, that this disease is markedly hereditary, and comes from a strong hereditary taint of insanity. It also appears in middle life, whereas the latter, hysteria, comes on generally between the ages of fifteen and thirty, and occurs in women or men not especially descended from markedly insane families.

The following case of general hysterical paralysis very well illustrates this type of the disease as it not unfrequently appears, and I accordingly insert it:

Miss ——, of Mississippi, aged twenty, was brought to my private hospital for nervous diseases by her family physician and her brother in the month of April last. She had never been in robust health, and during the last two years gradually lost the power over her arms and legs, to such an extent that she was not able to walk at all, even when supported, and had to be carried upstairs to her room by two nurses. She was entirely incapacitated from doing any work whatever. She first menstruated at the age of fourteen, but has always been very irregular, and generally has suffered from amenorrhœa. Eight months ago the menses ceased altogether, and from that time she became nearly idiotic. She has had hysterical mania, during which time, for a week, she screamed almost continuously, according to her brother's account. Her feet and hands were cold upon admission; there was considerable dilatation of both pupils; she spoke only in the faintest whisper, and even then very rarely. She had no appetite, and the bowels were obstinately constipated. She had been under medical treatment for a long time, but without any benefit. She had some retroversion of the uterus to left side, and some vaginitis. Examination by the æsthesiometer revealed that she could not distinguish whether she was touched by one point or two. The muscles were atrophied all over the body, the fingers were flexed in the palms, and the patient made no attempt to attend to the organic functions of the body. I prescribed a pill of aloes, iron, quinine, arsenic, and strychnia, to act on the bowels and as a tonic, and fed her with milk and beef essence, made in the house, until the constipation was relieved. I used three times a week the continuous galvanic current from thirty-two cells of a freshly-charged battery,

the negative pole to the neck, and the positive to the sacrum, for fifteen minutes. The sensation of burning was evidently well marked, as the patient drew herself away and tried to evade the contact of the electrode. The muscles of the calves of the legs were faradized daily for ten minutes. The pill, before mentioned, was kept up thrice daily, and massage diligently and faithfully applied by a good nurse. After four weeks' treatment, she was so much improved that she could walk about her floor, and now walks, August 1st, all over the house. The amenorrhœa yielded to the exhibition of capsules of apiol. She was very listless, had a vacant look, and was nearly, as I have said, idiotic. She regained her speech, and was discharged in perfect health, the muscular and nervous systems having become perfectly restrung.

Treatment.—The treatment of aggravated hysteria is almost impossible in the home of the patient and in the midst of the usual surroundings, as the moral and bodily constitution rapidly deteriorates under the influence of the pity, sympathy, and over-attention which hysterical patients live for, and which they are constantly laying plans to attract from their friends. There is no radical cure for hysteria but judicious firmness of management, combined with kindness and friendliness of manner on the part of the physician. This is much more easily accomplished by a change of scene and surroundings. In addition to improving the general health and bringing up the general nervous tone, regulating the menstrual function, relieving anæmia and constipation, and local symptoms of hysteria, the patient should be made to take an interest and pleasure in some occupation, intellectual recreation, or study. We must endeavor to remove the mental or emotional cause of the disease, and particular attention must be paid to diet, rest, exercise, and recreation. The class of patients whom we, as physicians, principally see, are women, who, from their social position and surroundings, have really no object in life but to amuse themselves. They have, as a rule, been spoiled and petted since childhood, and as their nervous system is developed far in excess of their *physique*, they become, as they grow up, capricious and hysterical. Their imaginary ailments are undoubtedly the cause of much distress to them, for to a person with highly strung nerves a slight pain seems a severe pain, and discomfort is magnified into pain. One of my last cases, who had an income of six thousand dollars, and who had nothing to do, and who had consequently become an aggravated

case of hysteria, would have been, as a physician who was also a patient with me, remarked, "a splendid woman if she had to live on twenty-five hundred dollars a year." It is certainly true that nothing to do, and nothing to profitably occupy the mind with, are strong provocations to hysteria in a person predisposed to it. Occasionally hysteria assumes a grave form and becomes hysterical mania, a condition requiring great care and attention. Such a case came under my care not long ago. The patient was a young lady, twenty-four years of age, and upon her admission she was acutely maniacal, with no appreciation of her condition or surroundings. She was a girl who had a highly sensitive nervous organization, and who, being a Catholic, had attended all the Lenten services, and, after attending the "General Confession," had arrived at a state of emotional frenzy which passed into hysterical insanity. She was entirely incoherent with delusions relating to religious subjects, and also relating to persons. The physical condition was very fair. She was given a warm bath, followed by one fluid drachm of Fothergill's solution of hydrobromic acid. This was followed in four hours by a 4-grain capsule of monobromide of camphor, and the patient slept well. For a week after admission, rest in a darkened room, with monobromide of camphor thrice daily, and Fothergill's solution, following the use of the prolonged warm bath, was employed. At the end of that time the delusions had disappeared, the mania had subsided, and the patient made her appearance in the family circle. Electricity, in the form of central galvanization, was applied daily. Daily exercise was insisted upon, and due remedial treatment continued, and in a short time a perfect recovery took place. The lady has since married, and has enjoyed perfect health up to the present time.

Hysterical patients require to be watched, attended to and unconsciously guided away from self and into new grooves of thought, feeling and action, at once interesting to the mind, while not fatiguing to the body; and this can be done, not by harshness or discipline, but by kindness, firmness and wise regard to the feelings of the patient. We must supply some purpose or motive in life which can easily be done by studying patients' characters, thus stimulating them to make co-operative endeavors for their own cure, unknown to themselves. All this requires strong will and great patience on the part of the physician, but success is certain if such treatment be persevered in and is not interfered with by over-anxious friends or relatives. With regard to the medicinal treatment to be pursued, I have used

with benefit monobromide of camphor, two or four-grain pill thrice daily, Fothergill's solution of hydrobromic acid, the chloral-phosphide of arsenic (Routh's formula), the bromide of lithium and the constant current of electricity. Niemeyer said: "There is no doubt but that the morbid excitement of the motor nerves which gives rise to hysterical spasms, proceeds from the spinal marrow and medulla oblongata." And this morbid excitement is, in my experience, very markedly relieved by the employment of the constant current in the manner I have spoken of. It is certainly one of the most effectual nervines and affords radical relief in most cases, instead of the merely palliative effects obtained from many drugs. The psychical treatment is, however, of primary importance. By the use of the galvanic or constant current of electricity, we modify the circulation and nutrition of the whole body, and from my experience with it, I am more and more satisfied, as Niemeyer said: "that in the constant current, we have a means more powerful than any other of modifying the nutritive conditions of parts that are deeply situated."

When hysteria is caused by uterine disease or by anomalies of menstruation, the original cause must, of course, be removed, if possible, by appropriate treatment. In several cases I have discovered the existence of dysmenorrhœa, which I have entirely cured by the fluid extract of viburnum prunifolium in 1-fluid-drachm doses. This in some cases is a very valuable remedy. In cases where the hysterical state seems to depend upon chronic uterine disease, in married women, when there is a condition of malnutrition and passive congestion, to improve the uterine tissues and to excite reflex action, so that the nerves accompanying the distended vessels will cause contraction, and thus restore the natural tonicity, I direct the prolonged application, by the nurse, of hot-water vaginal injections, with local application of electricity as an adjunct. By this means we are generally successful in combating the state of chronic inflammation that exists in such cases.

In conclusion I would say, study the uterus and ovaries and see that existing diseases, if there be any, are remedied. Examine the eyes, if you find head symptoms in hysteria and neurasthenia, and I would place the utmost stress on the systematic treatment by rest, seclusion from society, full feeding, massage and electricity. This treatment, if carefully carried out by trained nurses, will restore many women to health who are entirely discouraged by the failures of their

physicians to cure them, and many of whom are on the borderland of insanity.

Nervous affections, and especially hysterical disorders, are very contagious. The following interesting case illustrates this fact. The inland market-town of Pledrau, in France, has inhabitants who lead a very primitive mode of life, and who are very ignorant, credulous and simple. Any unusual occurrence is attributed to an occult influence. They are under the exclusive control of their curé. Near this town live the Marcet family, in which were seven children, a few months ago, said to be "*possessed by spirits.*" February 23d, 1882, Marie Jean Marcet had a nervous attack, with pain in the head and sickness, and hysterical paralysis, lasting four days, and chorea-like movements. They soon ceased, and did not appear again until the 21st of April. On the 22d of April, the third child, Pierre, aged 11 years, was suddenly attacked, and his attack lasted four hours; twelve days after he had a second hysterical fit, and since then he has been very nervous and excitable, and very irritable. On the 23d of April, the second daughter, aged 13 years, had a nervous attack resembling in all points that of her sister. Next day, that is the 24th of April, the fifth child, Anne Marie, aged 6 years, had an attack of unconsciousness. On the 28th, still another of 4 years showed hysterical symptoms, and finally another child suffered from unmistakable hysteria. This is a very remarkable instance of the contagiousness of nervous affections, as this hysteria major evidently appeared in this family as a small epidemic.

Dr. Samuel Wilks, Physician to Guy's Hospital, has said:

In women at the climacteric period we see the effect of lowering of the nervous influence in the fluttering of the heart, and the sickness, sighings, headache, etc. Probably no other invalids really feel so ill as these patients; the whole bodily functions are disturbed, and consequently a depression is experienced far exceeding that which accompanies any real organic disease. Such patients describe their feelings with the utmost despondency; they experience successive changes of temperature, which they style flushes of heat; they complain of anorexia, of flatulence, and of irritation of the bowels, uterus, or urinary organs. In fact, there is not a single viscus which does not suffer disturbance, so that every disease in the nosology may, in turn, be supposed to be present. Why one organ should suffer more than another, or why a morbid sensation should be experienced in this part of the body rather than in that, is probably to be explained by the anatomical distribution of the nerves; but we certainly find that, probably owing to the large supply of the sympathetic nerve in the abdomen, greater depression is experienced in abdominal than in other forms of disease, and that in all low conditions of the nervous system morbid sensations are very often referred to this region of the body. Thus, we cannot but contrast the cheerful disposition of the phthisical patient, when on the brink of the grave, with the depression observed in one who has but a temporary

disturbance of his stomach, liver, or bowels; and another indication of the same fact is the placing of the emotions in these parts, as expressed by the term "bowels of compassion."

Under the most varied conditions, both in men and women, when life is low, a number of morbid sensations arise. In a state of health man should be as happy and joyous as the lark flying in the heavens; he should have a keen sense of animal enjoyment, and he should feel nothing of the working of the machinery within him; but when his nervous system is depraved he becomes conscious of all these movements, he feels his heart beat, his head throb, and his back ache. A study of these nervous symptoms would probably show in what order they appear; I think that they commence, especially in women, with a pain in the left side, and that this is followed by pains on the top of the head, and in the back, at the epigastrium, over the collar-bones, etc. I feel uncertain whether these pains are altogether subjective or due to some prior alteration of function in the parts whence the pain proceeds. This question, however, is one of very great importance in practice; for we often find that, by attempting to relieve symptoms, we gain no headway towards overcoming disease, whilst by altogether disregarding them, and having recourse to a general tonic plan of treatment, we can ensure a cure within a certain period. At the same time it cannot be denied that the application of remedies to the spot to which the morbid sensation is attributed is frequently attended with success. Thus, plasters to the side, sedatives to the stomach, etc., do give relief. Relieving the local symptoms in this way is not, however, incompatible with a treatment directed to the restoration of the nerve centres themselves.

In practice, we have almost every hour of the day to endeavor to discover whether morbid sensations in and disturbances of the viscera are due to an organic cause or to the mere failure of the regulating power of the nerves; that is, whether the disease is organic or functional. In such cases the diagnosis is doubly difficult in females, because symptoms resembling those of almost every form of disease may be produced by their more delicate nervous organization.

We can imagine, by way of analogy, that in the case of a steam-engine working irregularly we might for a time be at a loss to discover whether the derangement was owing to some material deficiency in the valves or joints, or whether it was due simply to an irregular supply of steam. Or, again, we can picture to ourselves a clock perfect in all its parts moving too slowly, from the simple fact of the weight having nearly run down.

In the cerebro-spinal system, again, an exaltation or a depression of function is constantly witnessed. Such conditions are observed in chorea, in hysteria, and in various passions of the mind. Müller speaks of the nervous principle in the medulla oblongata as being in a state of tension and always ready to act, and he says that the slightest change in its condition excites a discharge of nervous influence, as is manifested in laughing, sneezing, etc. Thus every mental impulse to motion disturbs the balance of this tension and causes a discharge of nervous influence in a determinate direction. He also compares the nervous system to a musical organ, with its bellows charged and ready to force a stream of air in any direction, according to the particular key that may be touched. Using this illustration, we may imagine the air either to rush out with a scream, or to be hastily allowed to pass off by the larger tubes, or to be diffused melodiously through a series of musical pipes. In a similar way the superfluous nerve-force may display its operations in various ways, according to the sex, age, and temperament of the patient. For example, I have seen the same cause produce hysterics in a mother and chorea in her child, the one disease being almost peculiar to the adult period of life, the other to childhood. The same fright which excited so great an amount of nerve-force in the mother as to cause the explosion known as hysterics operated on the

child in a slower manner, and gave rise to the less violent action known as chorea. The spinal system was excited to over-action by the cineritious substance above, which had been unduly stimulated by a mental shock, and remained temporarily impaired until the disease was cured. The explosion of nerve-force by an hysterical attack acts as a kind of safety-valve, protecting the internal machinery from danger; and although all are not alike impressionable, there is scarcely an individual who may not be in need of it when acted on by a sufficiently powerful stimulus. Even in the strong-minded Napoleon a fit is said to have been excited by passion. More commonly, however, relief to an over-excited nervous system is afforded by laughing or crying. Thus, as Byron observes, the power which women possess, as compared with men, of being able to pour their troubles into their pocket-handkerchiefs, is no doubt often very beneficial to them, so far as their health is concerned. A woman who is excited, if she do not go into hysterics or have a good cry, often allows the redundant nerve-force to escape through that unruly member the tongue, and thus an extreme volubility of utterance perhaps saves her from further unpleasantness. Of course, the talk which flows from her lips is altogether different from the result of an intellectual process; and thus it is still true now, as it was in ancient times, that "anger is a short madness." In Switzerland, last summer, I met an Irish gentleman, who told me that he could make his wants known without a knowledge of the language, but that when he was irritated and wanted to swear he would sometimes give all he possessed to understand German. In other cases, again, the superfluous force escapes by the limbs; thus an angry person slams the door, or destroys even her own property. A man of better sense, when vexed, takes a walk, and thus gets rid of his extra nerve-force; or, if the irritation and its results are more chronic, sits down, takes up his pen, and by publishing "the whole correspondence" eases his mind.—*Guy's Hospital Reports*, vol. xii., 1866, p. 247.

Dr. F. C. Skey, Esq., F.R.S., Consulting Surgeon to St. Bartholomew's Hospital, has said in respect to hysteria:

In the whole range of practical surgery there is, perhaps, no one subject that claims your earnest study more important than that which I have selected for this and the following lectures. It is not a question of diagnosis between two diseases more or less resembling each other. It is a question of disease or no disease, of reality or imitation, of true or false—of whether your purgatives, your bleedings, sweatings, irritants and counter-irritants, and your whole battery of antiphlogistics, shall be launched against a true disease in the flesh, or its ghost—whether you are to contend with a reality or a shadow. This absence of discrimination between two conditions of disease and no disease is painfully frequent among medical men, especially among those to whose charge is assigned the care of local and surgical diseases. "In one shape or another," observes the greatest of modern surgeons, "you will meet with them at every turn of your future practice." It may be asserted with truth that every part of the human body supplied with nerves, be they cerebral, spinal, or ganglionic, may become under provocation the seat of local symptoms so closely resembling those of the real disease to which that part of the body is liable, as to appear identical with it, and the resemblance to which is so perfect as to deceive the best of us. They are not cases of occasional or rare occurrence. They come before us in the daily and hourly walks of professional life. They monopolize a share, and not a small one, of all cases under treatment, whether medical or surgical, but the latter predominate. The closer you scrutinize them, the more penetrating your inquiry—looking into, and not at them—the more perfect will be your diagnosis, and the more you will be astonished that a form of disease

so remarkable and so common should have hitherto occupied so little of your thoughts. It is well to call your attention to this description of malady at the early stage of your career. Many men pass through life, engaged in active warfare against disease, on whose convictions this variety has scarcely dawned. And this is a truly remarkable fact, which owes its existence to the predominating influence which the heart and the arterial system exercise over the judgment of the profession at the expense of a system yet higher in the scale of organization, more sensitive, and more liable to morbid impressions—viz., the cerebro-spinal nervous system.

Whenever a new case of disease presents itself to us we jump to the old doctrines of inflammation, we talk of congestion, and of capillary action, and of deposits of lymph, and we refer the attendant pain and heat to an inflammatory condition, of which the local nervous derangement is an ordinary symptom. We should endeavor to assign to each system its proper place in the pathological scale and to discriminate more accurately than is generally done the indications which belong to the morbid condition of each, whether existing in combination or separately; for be assured they do exist, both separately and in combination with each other. You may have varieties of inflammation in which the local pain is trivial when compared with its severity in other cases, while, on the other hand, examples daily occur in which local as well as general derangement of the nerves, whether of the part or of the whole body, exists as a condition entirely independent of the vascular system. Nor is this derangement confined to the sensory nerves. If we have local pain as the indication of excessive activity of the nerves of sensation, we have spasm and convulsions, indicating derangement of the nerves of motion, each of which, or both, may prevail without heat, or redness, or swelling. We daily see severe forms of nervous exacerbation without the slightest corresponding increase of action in the vascular system. There is this important difference between the morbid states of the vascular and nervous systems, that, while local inflammations are dependent on local causes, aggravated only by the impaired condition of the general health, local nervous diseases for the most part originate in the centres of nervous power, the effects of which are exhibited in remote parts of the body—it may be in a pain localized in a given spot, whether on the surface or in deeply-seated parts which, to our senses, holds no especial relation to its nervous centre; it may be in a temporary, or spasmodic, or permanent contraction of the voluntary muscles bending the joints of the extremities in permanent flexion, or obliquely drawing the head upon the trunk, or involving the whole motor system, as in tetanus. No known nerve that conveys sensibility from its centre to its periphery, no motor nerve that carries volition from the brain or spinal cord to a voluntary muscle, is exempt from this morbid tendency.

The vascular system, consisting of arteries, capillaries, and veins, has its own special diseases, peculiar to the structures engaged in the circulation of the blood. The attendant symptoms are heat, redness, pain, and swelling, the latter symptom being due to a separation from the capillary system of some constituents of the blood, whether in a fluid or solid form, while the morbid condition of the nerves and the structures in which they originate are characterized by simple aggravation or excess of the functions of the nerves affected, the natural sensibility of the sensory nerves running into pain, and the moving power of motor nerves into convulsions, or spasm, or permanent contraction. In diseases of the vascular system we have changes of structure; in the latter, not. It is necessary to make very clear the line which separates the two classes of disease, lest we fall into the common error of applying to both the remedial agents which are applicable to one only. The diseases originating in or involving the vascular system we treat locally by various agents—leeches, blisters, etc.; in diseases confined to the nervous system these local remedies are useless and even injurious, and we treat them through the constitution.

In cases of tic do we derive benefit from leeches, or blisters, or from other forms of depletive agents? Assuredly not.

Now the disease which forms the subject we have to consider belongs to the nervous and not to the vascular class, and I select from this variety that occasionally known under the term "hysteria," than which no name can be more inappropriate or objectionable. It may well be doubted whether, except under very occasional circumstances, such a relation holds between the womb and this remarkable train of symptoms as to justify the employment of the term hysteria. In the large majority of cases there is no connection between them beyond that which the disease holds with the other organs of the body. In the name of a disease we are supposed to recognize its form and nature, whereas the term I have quoted conveys to the mind no distinct idea of either one or the other. And there is a positive objection to the resort to it in the fact that the word carries with it the association of a malady of small and insignificant dimensions, while the malady itself is of great magnitude. We associate with it the idea of "hysterics" and "vapors," as they were formerly called. I wish to raise your attention to the level of a great malady, and not of a trivial derangement of the hour. I remember a law case in which the counsel challenged a medical witness as to the name of the disease, and he replied, hysteria. "Hysteria!" said the learned counsel, addressing the jury, "we all know what hysteria means. My client has come into court to obtain compensation from a jury of his country for a permanent injury by which all his prospects are blighted, etc., etc., and the gentleman in the witness-box, with no sympathy for his misfortune, proclaims the disease to be a case of trumpery hysterics!" and the jury, with rod in hand, let it fall heavily on the defendant's back. But there is a more solid objection than these, viz., that it is founded on a false pathology, in the employment of a term that conveys an impression of its source and nature founded in error. The disease consists in the local evidence of some irritation or derangement of one or the other of the nervous centres of the body, viz., the brain or the spinal cord—at least, such is the received pathology. But the subject is a very obscure one. We have no very definite idea of what we mean by "irritation." We all employ it, and so general is its use that I don't know how we can get on without it. "Irritation of the nervous centres" is a useful and not ill-sounding phrase, though somewhat mysterious, but it is no reflection on medical science that we can't explain all the phenomena of life, and as the term is somewhat wide in its application and does not commit its employer to any very defined opinion on obscure matters, on which it is very difficult to form any opinion at all, I presume we shall retain it. One good reason that may be assigned for the persistent employment of the term hysteria —a term we all know to be objectionable—is the difficulty of finding a substitute for it. We call the disease "local nervous irritation." It is "exalted nervous sensibility," but in naming a disease so definite as this we require a term equally pointed and definite with the thing itself. That we have not got. Sir B. Brodie says: "I employ the term hysteria because it is in common use, but the etymology is calculated to lead to great misapprehension."

Failing the name, let us look at the thing, and if it be so critical as I have assured you, let us attach to it the great importance its frequency and its magnitude demand.

It may be asserted with truth that every part of the body may become, under provocation, the seat of an apparent disease that in reality does not exist; that it may, and often does, assume all the attributes of reality with an exactness of imitation which nothing short of careful and accurate diagnosis can distinguish from the real disease. You think this is impossible. Surely you know a diseased knee-joint when you see it. You find severe pain, aggravated by the slightest movement. The temperature of the joint may be raised, and it is slightly swelled. You leech, you blister, you employ an iodine lini-

ment (few cases escape it), you may even resort to issues, but the evil remains in spite of all your remedies, which have been applied to the wrong "system." It is the nervous, not the vascular that is involved, but the nervous has imitated the vascular, and deluded you, and led to the employment of false remedies, which have failed to reduce the pain or give mobility to the joint, and the general influence of which on the health of the patient cannot be said to have proved eminently serviceable.

The case, on more perfect investigation, proves to be one of local nervous irritation or hysteria. You think you will not be again deceived, but you are mistaken. A single error, corrected by the experience of another, will not teach you hysteria. You are consulted by a lady in reference to a daughter of 18 or 20 years of age, who has exhibited failing health for some time, and now complains of her inability to walk in consequence of a pain in her back. You examine her, and discover that she suffers extremely on pressure over two or three of the lower dorsal vertebræ or on any other of the twenty-four. You repeat the examination with the same result, and you make a report to the mother that her daughter has "spinal disease." The result of your opinion is two or more years' confinement to her couch, coupled with the usual allowance of restricted diet, alterative and other depletive medicines, leeches, blisters, and issues. Suppose these structures which you have declared to be the seat of organic disease to be examined under a microscope, what would you discover? Nothing. There is no disease whatever. As the nature of this malady dawns upon you, now awakening to a conviction of its frequency, you resolve to be more wary in your future diagnosis. You are now consulted by another young female patient on account of a tendency in one or more fingers to close in flexion. In the attempt to straighten them you cause intense pain, and, if persisted in, the consequences may be serious. Your patient appears in fair average health, and all her functions are regular and healthy, while the hand, for all ordinary purposes, is useless. Under the idea that she may have some chronic inflammation of the theca or of the palmar fascia, you treat it with the usual remedies. But your remedies produce no impression on the finger, which continues obstinately flexed as before. You adopt another principle of treatment, founded upon a more correct diagnosis, and your patient recovers. These cases sound strange to your limited experience. You think they are rare, and brought forward from a distance and with an effort. By no means. They are cases of daily occurrence. If you could suddenly throw off that nebulous vision of vascular disease which years of bad pathology have impressed upon your judgment, you would see them in their true light. You may deem them to be exceptional. I assure you they constitute the rule of disease, and not the exception. *Real disease is the exception.* Speaking of one variety, and they have all characters in common, Sir B. Brodie, a man who rarely committed an error in diagnosis, says: "I do not hesitate to declare that, among the higher classes of society, at least four-fifths of the female patients who are commonly supposed to labor under diseases of the joints labor under hysteria, and nothing else." I would venture to enlarge this statement as regards the "upper classes" by including a large proportion of the lower, for much of my own experience of hysteria has been obtained from the wards of St. Bartholomew's Hospital, and in reference to spinal affections in young persons, I unhesitatingly assert that real disease is not found in a greater proportion than one case in twenty, and even this is a liberal allotment. Have you never experienced the difficulty of discovering an object floating in the air, such as a bird singing overhead or an early star in the evening? When once the object becomes visible the eye is readily adjusted to it, and when you look again in the right direction it is the first object that strikes the eye.

And so with this class of diseases. They are not seen, because they are not looked for. If you will so focus your mental vision, and endeavor to distinguish the minute

texture of your cases, and look into and not at them, you will acknowledge the truth of the description, and you will adopt a sound principle of treatment that meets disease face to face with a direct instead of an oblique force, which far too generally claims the credit of a success for which nature alone is responsible.

I have selected above three varieties of this local hysteric affection. Let us consider them a little more in detail, with a view to detect the fallacy which classes them under diseases of the first or vascular division, by which I mean an abnormal condition of the bloodvessels leading to changes of structure or altered relations, whether by suppuration or ulceration, or fibrinous deposit, or local death of the tissues involved. In the first case the knee is the seat of pain. The subject is a young female. What evidence do we commonly look for when the joint is really diseased? We look first for a cause. Diseased joints don't occur without a palpable one, and particularly in young persons. There has been no violence, no fall or blow, to which to attribute it. Had there been, the nature of the disease is obvious enough. There is no considerable increase of heat, and, if inflammation is present, perceptible increase of heat is constant. There is no effusion into the joint; the form of the articulation is unchanged. The pain and the immobility or stiffness of the joint remain, notwithstanding your remedies. Local depletion relieves the pain of inflammation, but not of hysteria. But you persist in your principle, and the depletive principle is continued, and thus months elapse—yes, even years. I was once told by a young lady that she had applied twenty-seven blisters to her knee-joint, from which she could not say she had derived any benefit. Now, it ought to be obvious that if a painful joint, occurring in a young female without local cause, is unaltered in form or size, and is free from heat or redness, and that the chief and almost the only symptom, that of pain, varies in degree at different times and is fluctuating in character, the disease is not of the inflammatory class, and if not, it must be nervous, and you cannot cure pain with leeches. You know that pain alone, which consists in an exalted nervous sensibility, does not constitute what we strictly understand by the term *disease*, although we apply it generally to any deviation from health, whether local or constitutional. At length the truth is brought home to you. You change your treatment by the substitution of local sedatives and general tonics, and your patient moves forward in the direction of recovery.

Take the second case. You have declared your opinion that this girl is the subject of disease of the spine upon the evidence of local pain produced by pressure of the fingers on the spinous processes of the vertebra. It has escaped your observation that this pain is equally severe, whether pressure is slight or not, that, in fact, the degree of pain indicated by either writhing or exclamation holds no relation to the force of the pressure made. The slightest touch creates as much suffering as the greatest pressure of the hand, and *often more*. It is on this evidence alone you have founded your opinion of disease of the bony structure of the spinal column. It is on this evidence you have consigned this young lady to two years' confinement to her couch, to the loss of education, to restricted social and domestic intercourse with her family and friends, and to much moral and physical suffering. Now, when you talk of disease of the spine, what do you mean? What *structure* is diseased, and what form of disease is present? Is it seated in the body, or in the processes of the vertebræ, or in the entire bone? And what description of disease has invaded the particular vertebra of the twenty-four? Is it inflammation, or caries, or necrosis? Caries, you will say, and you select this form, because, and only because, you know the spinal column is the subject of carious disease under conditions favoring it. But there is this remarkable feature in carious disease of bone well worthy of notice—viz., that it is almost destitute of pain, that there exists no relation between the extent of the disease, which may be great, and the pain attendant

on it. It is not like inflammation of bone, whether simple or severe, or necrosis. Presuming this statement true, can you, in reason, feel satisfied with the evidence of disease obtained by manual pressure? Then, again, where is the disease situated? If in the body of the vertebra, is it not almost absurd to suppose you can detect it by the slight pressure of the finger *on the summit of the spinous processes*, which are themselves rarely involved.

Fifty or sixty years ago, a provincial surgeon of some note recommended the application of a hot sponge to the spine, with a view to detect disease of the bodies of the vertebræ. There was some excuse for ignorance on this subject at that time; there is none now. Of all the fallacies that cling to professional practice, of all the false doctrines which the pardonable ignorance of a former generation has entailed on modern surgery, none can surpass that which affects to detect carious disease of the body of a vertebra by drawing the fingers down the spine. It is only not ludicrous, because the consequences are so serious to the victim. It would be a bold assertion that such morbid changes in the spinal column cannot occur; but I do think humanity would be a gainer, if all teachers concurred in asserting that they *could not*, so rare is the real disease, and so palpable to the eye when present. Suppose a young person, in moderately good health, and occupied in daily exercise, complained of a pain in the condyle of the femur, without any other indication, should you be warranted in declaring she had serious disease of the bone? Look to the functions of this important column; how is it possible it can support the body in the upright posture, if one or more of the component bones of the pillar are destroyed? And yet I have known many examples, in which the subject of this imaginary disease has joined a party, and danced for the whole evening. One wonders that such a person did not drop into pieces. For myself, I candidly declare that I have scarcely ever seen a case of true disease of this form. I can bear testimony to spinal affections and destructions of bone to any amount in psoas or lumbar abscess, or in angular curvature, or of damage done to the column by local injury; but to these supposititious cases, which exist only in the brain of the surgeon, I am a stranger, and if they exist otherwise than as rare examples of spinal disease, I have much to learn. Have you ever seen a person recover from actual disease of the spine? I do not mean to infer that death inevitably follows, though that result is by no means uncommon; but I allude to recovery without some distortion, or some permanent evidence of past disease. And yet you may be surprised when I assure you that all these young people recover sooner or later—sooner, if the surgeon in attendance is familiar with hysteric affections! later, if he is not. Thirty or forty years since, these cases were, happily for our time, far more common than at present. At that date, and for how many years anterior I know not, all the seaside towns were crowded with young ladies, between seventeen and twenty-five years of age and beyond it, who were confined to the horizontal posture, and were wheeled about on the shore in bath-chairs, on the supposition that they were the subjects of spinal disease. They were placed under much medical and dietetic discipline, not of the most invigorating character, and the large majority carried a pair of handsome issues in the back! Brighton, Worthing, Hastings, and other places on the south coast were tenanted largely by these unfortunate females, to which a moderate sprinkling of young gentlemen was added. What has become of all these cases? They appear to have vanished just in proportion as the eyes of the surgeons have opened to the absurdity of inferring that pain alone, which locates itself with remarkable precision in hysteria on a given vertebra can indicate the presence of organic disease of the body of the bone without collateral evidence in its favor. When the spinal column is really diseased the case is obvious at a glance; the health is degenerate, and the whole system proclaims to the

eye of the surgeon the presence of a great evil. These examples are but a miserable mockery of the reality and a fraud on the judgment of the ignorant.

With regard to the third example, that of permanent flexion of the fingers, it is apparently so truly local an affection that there is some excuse for error, but only because hysteric affections are not half studied. When one or more of the fingers is permanently flexed from local causes, the seat of the disease will be found in the fascial structures of the hand or in the finger itself, or a joint may have been diseased or dislocated; but here there is no thickening, nor hardness, or other morbid change of structure. The finger is simply bent, and the attempt to straighten it is painful. The cause of this morbid condition of the flexor muscle is referred to its nervous centre placed in the cervical portion of the spinal cord.

It is not an easy task to select the class of constitutions most liable to hysteric diseases. Probably under certain conditions of impaired health the large proportion of the community would give evidence of its presence. Certainly it is uncommon in the lower class of males, and among those who occupy the beds in our public hospitals. We know, on the other hand, that it is most prevalent in the young female members of the higher and middle classes, of such as live a life of ease and luxury, those who have limited responsibilities in life, of no compelled occupation, and who have both time and inclination to indulge in the world's pleasures—persons easily excited to mental emotion, of sensitive feeling, often delicate and refined. Such are among the mental attributes of hysteria. But hysteric diseases are not confined to the young. I have seen many examples in females of 40 to 50. Do not imagine hysteria is a disease of persons of weak minds. It will often select for its victim a female member of a family exhibiting more than usual force and decision of character, of strong resolution, fearless of danger, bold riders, having plenty of what is termed *nerve*. If you tell such young people they are nervous, they take offence, because they misinterpret the meaning of the word, and so may you. And they may well misinterpret it, for, like the word, "irritation," its popular meaning is both various and indefinite. It is essential that we attach a definite idea to this term in its different applications, and I must digress for a moment to endeavor to explain them.

I have already used it in one sense.

1st. The word nerve is used to express the mental condition of vigor, boldness, and resolution—as when a man's nerves are strung up to meet danger; so ladies are said to ride with more or less "nerve."

2d. We employ it in its physical sense as a part of the general system of the nerves of the body.

3d. We have the terms "nervous system," which may be not inappropriately defined as holding the same relation to the "system of nerves" in its physical sense that the physiology of a part holds to its anatomy. Yet this definition is imperfect, because the properties of the nerves of the cerebro-spinal system, with the small exception of those of specific sensibility, such as sight, smell, taste, etc., begin and end in the functions of motion and sensation. By the term "nervous system" we understand the general influence which the nerves in a physical sense exert on the constitution, the healthy or tonic condition of which is in a ratio with the combined force of the two systems—viz., the arterial, or circulation of blood, and the nervous. Health depends on the coincidence of these systems in perfect action. If the circulatiou fails in power, the consequence of this weakness falls on the nervous system, which is dependent on the circulation for its health and vigor. Failing an adequate supply of blood, this system is unstrung, and morbid sensations, endless in variety, take the place of real; and of all consequences, hysteria is the most common. In the defficient supply of blood to the brain the faculties of the

mind are involved. Confidence of strength gives place to fear, mental vigor to weakness and irresolution. Such indications as are untrue to the real character of the individual as the physical sensations are false and deceptive. Such is the nature of the large proportion of cases of persons who come into courts of law for compensation for what are erroneously deemed permanent injury, bringing with them headaches, spinal pains, tingling of the extremities, impaired vision, loss of memory, and many other symptoms of an unstrung nervous system—a series of grievances of the incurable nature of which an acute lawyer takes care to provide himself with ample testimony, and which will always be obtained so long as the diseases of the vascular system and their consequences monopolize a too prominent share of the attention of our profession. I have traced several of these persons in their after career, the large majority of whom entirely recover. I believe it is to the prevalence of error in the early management of these persons, who are almost invariably subjected to depletive treatment, and to the imperfect knowledge of nervous diseases which prevails in the profession, that large sums are awarded for injuries erroneously supposed to be permanent and incurable. Can it be reasonably expected that the truth will be brought home to the mind of a lawyer so long as our own opinions are yet uninstructed upon it? Sooner or later their true nature will become established facts in the minds of our profession, and we shall no longer hear the painful discrepancies of opinion among medical men that now prevail. The light of improved knowledge will dissolve the daily mysteries which surround these cases in the form of supposed spinal concussions, partial paralysis, effusions into the theca vertebralis, thickening of the membranes of the brain, spinal cord, and lesions of this organ or that. These, as Dr. Sydenham declares, are but imitations and resemblances, and not realities, and that they deceive the multitude is undoubted. When real disease prevails there is no difference of opinion among medical men as to its existence.

It is a very interesting question, to investigate how far the functions of the mind are involved in hysteric disease, and how closely it is connected with it, whether the relation between them is direct and immediate, or remote. In cases of local pain, and also the local contraction of muscles, arising either from an excessive action of one muscle, or from the loss of harmony of action with its antagonist, as in a permanently flexed forearm or finger, it seems difficult to identify the evil with that part of the brain which we believe to be the seat of mind. And yet an inquiry into the past history of such persons will often reveal the fact that they have been at one time or other the subjects of general or paroxysmal hysteria, or, in other words, that they have had hysteric fits; and as mental emotion is more or less associated with this form of hysteria, it would appear not unreasonable to infer some remote relation between the mind and this variety of a disease apparently simply local in its nature. There is something in the mental development of these young persons very characteristic. They are quick and excitable, liable to sudden emotion without adequate cause. In very young persons the local disease may be developed before the mental character is fully matured, but advancing years will exhibit its peculiar features.

It is curious to observe the influence which the nervous system exerts on the daily condition of us all. When unstrung it preys upon ourselves. It is not in the varying force in our pulse, for that gauge is not sufficiently fine to detect the variations of health, that we can refer in consciousness of strength and vigor on one day that fails us on another. It is that our nervous system is more or less unstrung. There is a real illness and a factitious illness, and in this we observe the remarkable influence of mind in exercising a controlling power over the body. People without compulsory occupation, who lead a life of both bodily and mental inactivity—people whose means are sufficiently ample to indulge in, and who can purchase the luxury of illness, the daily visit of the physician, and,

not the least, the sympathy of friends—these real comforts come home to the hearts of those ornamental members of society who are living examples of an intense sensibility, either morbid or genuine, who can afford to be ill, and will not make the effort to be well. They are, in truth, well or ill, as you choose to take it, and they are only ill because they fail in mental effort, that mental resolution which is sufficiently powerful to rouse the dormant energies of the body and throw off the sensations of lassitude, of unreal fatigue and weariness of body and mind. A poor man cannot afford this indulgence, and so he throws the sensations aside by mental resolution.

There is a real fatigue and a nervous or unreal fatigue. A lady will tell you she was so tired that she could not walk another step. She thinks so, and without an adequate motive she cannot make the required effort. Give her the motive, such as the sudden illness of a relative or friend at a distance, and she will extend her walk to miles without effort or subsequent fatigue. How is this? It is that by a great motive acting through her mind she has called upon those dormant powers of her system which are possessed by all of us to be employed on critical occasions. Rarely, if ever, is the body subject to a degree of fatigue so great that an adequate motive will not obtain renewed exertion. When a lady tells you she can only venture on a walk of half a mile, you will understand that this effort is determined, by the ordinary, not the extraordinary motive. It is your duty as her medical attendant to place before her such inducements to a greater effort as shall call on the exercise of her dormant power, *the reserve fund* of physical strength, and she will walk four times the distance without fatigue. A poor man runs a race against time, and reaching the goal he drops from fatigue. Offer him at the moment £100 if he will run one hundred yards farther. He will accept the offer, run the required distance, and then drop. This is resolution acting on his muscular powers through his nervous system, screwed up by an extraordinary effort.

And this law of Nature is applicable to us all in our daily intercourse with the world. A man resolves to accomplish a certain amount of work on a given day, and he completes the task he has assigned himself by virtue of his resolution. Such resolution is eminently protective against fatigue.

A question arises to one's mind—Is hysteria what is termed a specific disease, or is it the invariable result of a condition of health into which all persons pass in reduced states of bodily vigor, but only modified in degree? I presume it is associated with a peculiar organism common to man, but not involving all, as some persons amenable to the influence of mesmerism pass readily into profound sleep, while others are entirely unaffected by it. It notoriously is far more common in women than in men, and in young persons from the age of 17 to 30, in the unmarried than in the married. We do not associate hysteric affections with persons of either sex who are characterized by vigor of mind, of strong will, of strength and firmness of character. Such persons may be reduced by protracted illness to a condition of weakness both bodily and mental, but they do not in their reduced strength, so far as I know, exhibit any of the peculiar features of hysteric affections. There is a remarkable form of hysteria which affords evidence on this subject. It is notorious that the sight of a person under an hysteric attack has a tendency to involve other hysteric persons around her. It has happened to me several times in my hospital career to witness the contagious, or rather the imitative, form of active or paroxysmal hysteria on a large scale. On one of these occasions, in a ward of twelve females, no less than nine young women were affected at the same time. Several were so violent as to call for the assistance of sisters, nurses and other servants of the establishment to restrain them; and inasmuch as a person under the influence of hysteria brings into action all the latent strength of her muscular frame, which is greatly in excess of her apparent strength, the services of these attendants were scarcely sufficient for the purpose—several

requiring three or four strong men to prevent injury to their persons. The attack commences in the person of one girl, who may have been the subject of some trivial operation, or been brought under the immediate influence of the disease by mental emotion. No sooner is the condition of this patient observed by her fellow-patients than her influence is felt throughout the ward, and the second subject may become involved, occupying a bed at the remote end of the room, and thus it passes irregularly from bed to bed, each patient appearing to take the disease in the order of their constitutional liability. In the course of an hour, more or less, it subsides, and tranquillity is restored, but the evil only slumbers, and on the following day the same scene may recur—less violent, pehaps, but acted by the same persons as at first. Some of these patients, who were not affected to violence, were affected to tears and wept in silence, while some few were not implicated at all, nor did they show any tendency to sympathize with the disease. These curious attacks, though they appear to the subjects of them irresistible, are yet but the result of what has been termed a surrender, and might be prevented by an adequate motive. The mode adopted to arrest this curious malady consists in bringing these persons under the influence of some powerful mental emotion, and in making some strong and sudden impression on the mind, through the medium of, probably, the most potent of all impressions, fear. They are not lost to consciousness, and for the moment, except in the intensity of their paroxysm, they will listen to the voice of authority. Sympathy and kindness, or tenderness of voice and manner, are worse than useless. They rather aggravate than mitigate the evil. Ridicule, to a woman of sensitive mind, is a powerful weapon, and will achieve something, but there is no emotion equal to fear, and a threat of personal chastisement will not necessarily be required to be carried into execution. On two of the occasions I have referred to, a few quarts of cold water suddenly thrown on the person of a chief delinquent instantly brought the ward to a state of reason and tranquility. The disease succumbed to the indignity of the treatment. There can be no doubt, then, that a malady spreading by sympathy and cured by fear, has its origin in the mind. I think you will find, on close inquiry, that nearly all cases of paryoxysmal hysteria originate in some form of mental excitement, and that of a depressing character, such as sorrow or disappointment. It is not the result of mere emotion. Joy, gladness of heart, or a sense of pleasure rarely produces it; yet it is difficult to explain either its immediate or proximate origin in attacks occurring during sleep. Sometimes these patients suddenly awake from sleep with severe palpitations of the heart leading on to a direct attack. What can be their immediate cause? There is no disease of the agents of circulation, or any suspected variation in the quanity of blood thrown upon the heart by which to explain it. Whence, then, the eccentric action of this organ? Possibly some mental emotion in the form of a forgotten dream or some other occult mental operation which escapes cognizance, such as occurs in cases of somnambulism.

In these current remarks on general hysteria we must not lose sight of the subject taken in a surgical point of view. I have stated, both in this and in the last lecture, that, under the condition of impaired health, the nerves of a part of the body may become the subject of a deranged action by which, as Dr. Sydenham has declared, and we in our generation almost daily observe, so many symptoms of actual disease of that part may appear as to give the exact appearance or verisimilitude of local organic change of structure, when such disease is entirely absent. There may be nothing apparent on a first inquiry to associate the case with hysteria, whether local or general. It is not necessarily nor commonly preceded by hysteric paroxysms. There may be no appearance of illness, no heat or undue excitement of the system, nothing, in fact, to connect it with hysteric disease; yet, it is nothing but local nervous exacerbation, and, from the want of a better name, we call it hysteria. You must not confound it with simple neuralgia,

and, with still less reason, with epilepsy. It is not, however, always easy to draw a distinct line between neuralgia and hysteria, for both may have a constitutional origin, and be amenable nearly to the same treatment. In neuralgia, however, we have a more generally local and more persistent affection of the nerve. The disease appears to be limited to the nerve itself, the course of which may be traced by the pain, which is often excessive; whereas, in those cases of hysteria marked by local pain, the pain is general, involving the structures around in common with real disease of the part affected. In neuralgia the disease is placed on a recognized nerve, and a person is said to have neuralgia of a given nerve, such as the frontal, mental, or digital. In hysteria any locality may be affected without reference to the distribution of nerves; while epilepsy is characterized by well-marked symptoms clearly of a cerebral origin. If you amputate a limb for hysteric pain, you throw the disease back on its nervous centre, and you kill your patient. In the early part of my hospital career, I have seen this fact more than once exemplified. In such cases operative surgery is entirely out of place.

Now, before I proceed to illustrate these statements by reference to cases, of which I have an ample supply, I wish to make a few remarks on the relation between local hysteria and the nervous centres—viz., the brain and spinal cord. Any facts that tend to throw even a gleam of light on the connection between them must be interesting. I refer to the influence of anæsthetic agents, especially of opium and chloroform. In cases of hysteria marked by local pain, relief is given by the application of opium to the affected part—a fact which does not confirm the generally-entertained opinion that the local affection is dependent on irritation of the nervous centre. Select a case of hysteric contraction of the muscles of a joint—the elbow or fingers. If you administer chloroform, the contraction of the muscles, which may have existed for months, and which has resisted repeated attempts to extend them, will now yield to a gentle effort of extension, and the limb is immediately restored to apparent repose. Supposing this morbid contraction of one or more muscles to be caused, as we believe, by irritation of the nervous centre, how does opium or chloroform affect it? The effects of chloroform on the circulation are assuredly not in the direction of health, for it converts arterial into venous blood, or, at least, it gives to arterial blood the dark color of venous, and we can hardly believe impaired circulation of a part of the body compatible with its improved function, and yet the disease subsides. This "irritation of the nervous centre," as I told you, does not convey a very clear idea of the nature of the relation between the respective parts—viz., the seat of the disease, and its source or centre. Perhaps, the nearest approach we can make to a solution of the difficulty is by saying that these two agents—opium and chloroform—suspend for the time the influence of both sensory and motor nerves, under which suspension the local pain or the erring muscle partakes of the general influence of the anæsthetic. To bring this morbid state of the muscle within the influence of the mind as its cause is almost of necessity to infer the local evil to be wilful; but if it were so, the state of unconsciousness during sleep would remove it, which it does not, for the contraction is constant by night and day, while the specific influence of the chloroform suspends the disease, if it does not cure it, and the renewed, though partial, contraction of the muscle is now prevented by mechanical agency. The remarkable circumstance consists in this, that a disease of long standing, which incapacitates for exercise and occupation, is removed in a few minutes by the agency of chloroform, and the patient placed at once on the high road to recovery. Is this curious fact confirmatory or otherwise of the origin of the disease in the nervous centre?

Unfortunately, hysteric persons have no exemption from real disease, and when the two are found in combination, a difficulty in diagnosis will frequently occur to test the pathological knowledge of the surgeon. The local disease is accompanied by symptoms

of an eccentric character that do not legitimately belong to it. Local pains are aggravated in the active stages, and do not subside in a degree proportionate to the local improvement. A small malady, such as a sprained wrist or ankle, is magnified into a large one. The constitutional symptoms take the direction of hysteria instead of fever. The vascular system indicuted by the state of the pulse, the skin, etc., is less involved than the nervous, and months will often expire before recovery is complete. To a surgeon, not familiar with hysteric disease, who practices his profession with reference to one only of the two systems of which the body is composed, these cases will always be obscure and difficult of management. When an injury occurs to the person of a young female, and to many others neither young nor female, hysteric symptoms are almost certain to develop themselves in some form or degree before recovery is complete.

[It is an indisputable fact that any part of the body can be the seat of such local derangement, either of the nerves of sensation or motion, as shall actually represent disease in that part, when no disease, properly so called, exists.]

Cases of real hysteria may be reckoned by hundreds in the practice of any one surgeon. The more common seats are the female breast, the side of the trunk, under the ribs, the whole spinal region from the atlas to the sacrum; any joint, but especially the knee; the stomach, the bladder, and the ovaries; the muscular system of the extremities, indicated by spasm or permanent contraction, and the muscles of the larynx. But no part of the frame has exemption from liability, so far as I am aware.

I will first quote a very simple case of hysteria, the evidence of which is immediate and the attack transient. In some slight forms, the patient loses all command over the voice, which suddenly sinks to an almost inaudible whisper, without any other accompanying symptom. I have seen many examples, but that I give occurred under my own observation, as it has probably in some form occurred under that of others, for it is as old as history. The subject was a young lady, of about 20, as Sir B. Brodie observes, of pale complexion, and having cold hands and feet. While I was engaged in conversation relative to her health, I somewhat imprudently remarked that a mouse was running about under the table at the end of the room. She uttered an exclamation of alarm, and in an instant so entirely lost the power of audible speech, that I was obliged to approach her, and to put my ear close to hear her. The ferocious cause of the mischief having paid the penalty of its intrusion by the loss of all it possessed on earth, the lady, in the course of an hour, recovered her voice. Had this person been in sound and vigorous health, she would probably have sustained the shock to her nervous system with less derangement of it. The case is interesting as showing the sudden influence of the mind on a particular nerve in the general system. Ammonia, chloric ether, henbane, etc., quickly administered, would probably shorten the attack, and for which agents brandy is a good substitute.

Cases of hysteric affections of the breast occur in young persons from 16 to 20. They are associated with a disturbed condition of the genital system, but not especially with the functions of the uterus itself. Although the catamenia is often deranged and defective, it is not necessarily so. The general system is at fault, indicated by a low circulation—frequently a chlorotic aspect, failing appetite, languor, and indisposition to any form of active bodily or mental effort. In the cases I have seen, the breast has been small and soft. The disease consists of simple pain in the organ, one or both, but more severe in one than the other. It is most active at the catamenial periods. The breast is unaltered in form and substance. The evidence of local inflammation is entirely absent. Leeches, or other forms of local depletion, give no relief. Blisters and irritating plasters and ointments answer no useful purpose. The degree of pain varies with the condition of the health. For a period it may almost cease—a period, coexistent with a change of air and

occupation, or a residence of a month or two at the seaside, but the pain relapses on the return of the subject to the ordinary habits of life. The pain is dull and aching, and very unlike the smarting and shooting pain which accompanies abscess, or the more formidable diseases.

With this history who will doubt the constitutional nature of the malady or the efficacy of such remedies as tend to change weakness for strength, to promote appetite, to keep the circulation in action by frequent exercise, taken at least twice daily?

Of examples of hysteric pain situated under the ribs, more commonly on the left side, it is needless to quote individual cases—they are so common. From some cause not very apparent, they are, however, seen less frequently than formerly. I attended, some years ago, a young married lady, the mother of three or four children, the daughter of a medical man of large experience, by whose direction she had been cupped about fifteen times over the seat of pain. The malady prevailed in her system in its active form during many years, and she was not free from it when I saw her at the age of 30. This treatment, which included the local application of leeches by the hundred, and blisters the sum of which might be calculated by the square yard, while it gave no permanent relief, has left its mark in more senses than one on person and constitution of this lady for life. At all events, her excellent parent has the merit of perseverance, if not of discrimination.

Among the cases of sympathetic or imitative forms of hysteria which I have already quoted, two of these females exhibited the scars of similar local treatment for supposed organic disease under the ribs, and I have seen many others. I need hardly tell you that this is a constitutional and not a local infirmity, and must be treated accordingly, *or not treated at all.* What structure or organ occupying this region on the left side, under the lower ribs, can be supposed the seat of this pain? It is deep-seated, and therefore the abdominal muscles are beyond suspicion. Is it the colon, or the spleen, or the base of the left lung, or the diaphragm? Whichever structure is involved, if any, rely upon it the essence of the malady is seated in the nerves, and the nerves only. If it were organic disease, its nature would become in time palpable. There is this important distinction between the two affections—that organic disease has a crisis, and nervous affections for the most part have none.

Spinal hysteric affections are, perhaps, of all hysteric maladies of the most common occurrence—happily they are becoming somewhat notorious. It is in the records of pathology, no doubt, that a young female may become the subject of real spinal disease; but where are the cases to be found? You may pass through life and not see two. And while I state this opinion your minds may possibly revert to some case you have already attended which you think exceptional. Look more closely into it, and you will detect your error. In forming an opinion on any given case on which you may be consulted hereafter, you had better make a starting-point from the knowledge of this fact, that nothing in pathology is more improbable than that a young lady should be the subject of organic disease of the spinal column. Well, a case presents itself for your opinion. A young female, in any class of life, in apparent health, pale or florid in complexion, bearing in her appearance no indication of disease, complains of pain in the back. This pain may be announced without surgical inquiry, or may be detected only on examination. The spine is exposed while the person is placed in bed. Pressure is made by one or more fingers on the spinous processes of the vertebræ, beginning with the atlas. On reaching perhaps the last dorsal or first or second lumbar vertebra, the girl utters an exclamation of pain, and she instantly shrinks from the pressure. The examination is renewed again and again with the same result. Twenty-three vertebræ admit of pressure through their final processes without causing suffering. Pressure on the particular one,

or perhaps two, causes instant and often severe pain. Who ever heard of real disease attacking one or even two vertebræ only?

I have already told you the probable result of this inquiry, but you, I trust, will not be deluded. Be assured to the extent almost of certainty that there is no organic disease, either of bone or of any other texture. I attended a girl in St. Bartholomew's Hospital of about 20 years of age. She had the appearance of a strong and healthy person, and there was nothing in her aspect to indicate that she was the subject of disease. Before I reached her bedside, the house-surgeon informed me she was the subject of "spinal disease," and I smiled at his credulity. To the students around I said: "If on examining this girl she makes an exclamation of pain and shrinks from the pressure of my hand, rely on it she has no disease whatever, and that her case is one of simple hysteria." On reaching the first and second lumbar vertebræ she uttered an expression of severe pain, and nearly threw herself out of bed. The diagnosis was confirmed, and she was treated for a nervous and not a real disease. Extract of opium dissolved in soap liniment was rubbed on the spine for a few days, and then the opium was omitted, and the back generally rubbed by the hand twice daily with some force of pressure. She was ordered valerian, bark, iron, and a full diet, with wine. Her recovery occupied one month.

I was consulted in the year 1862 on the case of a young lady of about 24 years of age. She had had "spinal disease" for several years, and many surgeons of more or less eminence had been consulted on her "very remarkable case." Her aspect was that of a healthy person. She was inclined to be stout, and exhibited no indication of serious disease, or indeed of disease of any kind. During five years her back had been most liberally cupped, leeched, blistered, and embrocated without benefit. I was informed that the pain had occasionally intermitted, that her condition had improved for a time and then relapsed, and that, although nearly the entire five years had been passed in her chamber, and in the horizontal posture, yet that occasionally she would join her family and seek relief from the monotony of her life in the gaiety of the ball-room, where she forgot her diseased spine and all its attendant miseries, and danced for hours with life and animation. I examined her back with more than usual care. The pain, always true to its own locality, occupied the second lumbar vertebra, and always returned on the pressure of my finger on that particular spot. Occupying her attention by conversation, I gradually subjected the whole back first to gentle, and then to severe, pressure. With both hands I grasped the trunk, and moved it forcibly in all directions without creating any sensation of pain. I then passed the flat of my hand rapidly down the spine, employing not pointed, but obtuse pressure over the whole surface, and thus satisfied myself that there was no disease. After the interval of a few minutes, pointed pressure on the second lumbar vertebra produced the same symptoms as at first. On examining the surface, I observed the mark of a cicatrix of about three inches in length running along the side of the affected vertebra, and on inquiry I learnt that one surgeon, whom the family had consulted, had deemed it necessary to look within and below the surface, under the supposition that there might possibly be a tumor or some morbid growth, the removal of which would be conducive to her recovery! Nothing, however, was found, and the excision of a small portion, I presume of the erector spinæ muscle, afforded no permanent relief—at least no benefit had arisen from the operation at the expiration of many months, when I was requested to see her. It struck me that this was carrying the experiment of operative surgery rather far, but I did not make any remark to that effect at the time. I certainly made an inquiry as to the product of the operation, and the father of the young lady told me that he was shown something, but he was not competent to state exactly what it was. On discussing the nature of the case with the family and the attending surgeon, I expressed my conviction of the hysteric nature of the disease,

and that she was capable of exertion could she be induced to attempt it. I saw at once that I had failed to convey my own convictions to the family, that my opinion was not satisfactory, and that in the judgment of the lady's father, a very sensible person, the opinion of one man could not outweigh that of many, and that the testimony of the many was the safer guide. The patient returned to her couch, on which she may be now reposing for ought I know to the contrary, for I saw her but once. I had, however, the satisfaction to hear the medical man say as I left the house, "I believe your view of the case is the only true one."

As treatment by means of issues was formerly in great resort, and is yet far from being abandoned as a means of checking the progress of carious disease in the vertebræ, it is worth considering for a moment the principle of its action. To control one disease you make another, which is supposed to act as a drain in carrying off the morbid actions of the original disease by derivation, or counter-irritation as it is termed. An issue is an ulcer, secreting matter, and drawing more or less on the powers of the constitution. An ulcer is a disease. All disease exercises a depressing, not an invigorating, influence on the system. The sum total, then, is increase, not diminution, of the evil. The morbid condition of true spinal affections is *caries* or crumbling of bone, not inflammation. Is it probable that a pair of secreting ulcers can tend to restore bone that is lost? Will the capillaries be more likely to secrete material to be converted into healthy bone within the body because you have made an ulcer outside? The actions going on within are those of deficiency, and not of excess. Here comes in again the old doctrine of inflammation. The operation of an issue is equivalent to that of the lancet, and in these days that instrument has become obsolete in the hands of all sensible and thinking men. I acknowledge with all regret, in looking back at the early part of my own professional career, to have frequently committed this error in treatment, and I willingly make retribution to another generation by declaring my conviction of the entire futility of an issue in this description of disease to answer any useful purpose.

While on a visit at the house of a friend in the country, I was requested to see one of his daughters who had been confined to her room for fifteen months in consequence, as I was told, of diseased spine. She was twenty-one years of age. Her countenance was pale, but not unhealthy. She had been condemned by a court of surgeons to a long confinement to the horizontal position, and she bore the judgment against her with resignation and humility. From the appliances around her, and the general arrangements of the room, it was obvious that the siege was to be long and vigorously maintained. My visit was not a professional one, and I did not propose to myself at the time to discuss the subject of her disease. Accident brought me into contact with her medical attendant, and in the course of conversation with him some features of her case were mentioned, which appeared not very consistent with real disease of the vertebræ. We examined her carefully, and the consultation which ensued terminated in the proposal that his patient should change the horizontal posture for that of an inclined plane. In a week she sat upright in an easy chair, and within a month she joined the family circle, entered into all their pursuits, and could ride any reasonable distance on horseback without fatigue.

I see no advantage in multiplying these painful examples of hysteric disease. They have all general characters in common, and are amenable to the same principles of treatment. And so with cases of supposed injury from railway accidents. Again and again have I heard medical men, physicians, surgeons, and general practitioners come into courts of law and state their opinion that the plaintiff had sustained grievous and probably permanent bodily detriment to the spinal column, on the evidence of pain produced by pressure of the finger on one or more of the spinous processes—evidence far more

than counterbalanced by the fact that these deluded persons have walked unaided into court, and have stood or sat in the witness-box for three-quarters of an hour while under examination.

No evidence of their reputed symptoms is obtainable either through the eye or the touch of the surgeon. There is nothing palpable, nothing organic. You take the assertions of your patient on trust, you identify yourself with his case; you place an object before him, and he declares he cannot see it; you refer to an occurrence that happened last week, he declares that he does not remember it. He suffers incessant pain in his back; he staggers in his walk, occasionally coming to a harmless fall; he has convulsive twitchings in his leg, occurring chiefly in bed, which he says he cannot control. He passes blood in his urine, which always escapes the notice of others, for it is invariably passed at the water-closet, and at no other time; but on inquiry you will find that this afflicted person can walk four or five miles; that as regards his vision his iris acts well, and the ophthalmoscope detects nothing; his appetite for food is sufficient for perfect nutrition. And let me ask you finally whether on these conditions it is more than remotely possible such a person can be the subject of any serious organic disease. But presuming on the possibility of such contradictory evidence occurring in a single and exceptional case of real disease, will your credulity reach so far as to admit of their frequent occurrence? To you such cases will be presented singly and individually, but they are brought into courts of law in multitudes.

One of such cases I will give you as an example: A man without property or profession brought an action against a railway company for injury to his spine. This statement, on the face of it, is an absurdity. How can a man without property bring an action at law? Well, he applies to a lawyer, who undertakes the case on his behalf, with a certain compact and understanding as to the question of future payment. Thus the lawyer becomes the plaintiff, and the plaintiff the witness in his own case. The man's injury was made out to the entire satisfactton of the jury, and very heavy damages were awarded by them, coupled with severe comments on the negligence of the railway directors.

It was positively known, at the time, by several persons engaged in the action, among whom was a detective officer, that within a few days of the trial the plaintiff, or the witness, whichever you please to term him, *had walked a match* against another man! Yet this man was declared on authority to have sustained a permanent injury of his spinal column!

With respect to hysteric affections of joints, knee cases, etc., they are in truth as common as Sir B. Brodie has declared them to be, and I thoroughly corroborate all he has said on the subject of this most important and interesting disease. Three-fourths of all knee cases in the upper classes of society, says this great authority, are not cases of inflammation, though they appear so. There is no organic disease whatever in the joint. They are cases of local pain, originating in impaired health. They are not amenable to treatment for inflammation and its consequences. Your liability to an error in diagnosis is just in proportion to the supposed infrequency of local nervous, as compared with vascular, derangement. The knee is by far the most frequent seat of these affections, and the cases are found among young women not in the lower classes of life—but even this class is not exempt. You will find, on the occasion of your first visit, the patient walking lame. This lameness has existed for several days, probably weeks, before attention has been attracted to it, and has come on very gradually. The joint is stiff—not that it won't bend, but the movement is painful. There may be some increased heat in the joint, when compared with that of the opposite limb, but not much in degree. The knee is slightly swollen. If you see the case after treatment has commenced—*i. e.*,

after the repeated application of leeches, blisters, and tincture of iodine (the almost universal agent in difficulty)—the swelling will be palpable, and the outline of the joint has undergone a change. As the case progresses, the lameness increases, but the aspect of the joint remains as in the first stage—neither the swelling nor the heat increasing in the same proportion. In this condition the limb may remain for months, or even for years, subject to the same treatment, without improvement. One feature in this case ought to have struck you as worthy of notice—viz., that so many months have passed without organic change; the joint is neither stiffer, larger, nor hotter than it was in the early stage of the treatment. I say it ought to have struck you. Perhaps it has not! The aspect of this lady is that of unhealth. She has become pale, partly from depletion, partly from loss of exercise. Her pulse is weak, her appetite bad, and catamenia, as a rule, defective. You fear to give tonics and alcohol, lest you aggravate the supposed local inflammation.

Having exhausted the negatives in treatment, you now venture on an onward step, and you give bitter infusions, gentian, cascarilla, with ammonia, and ether. But you are still behind the necessities of the case; you have adopted from the beginning, a false diagnosis, and the difficulty is now to get back to the right groove. There is only one course: begin afresh, and treat your case on a different principle; convince yourself that nerves may go wrong as well as arteries and capillaries, and as you treat excessive action, rightly or wrongly in the bloodvessels by local depletion, so apply such remedies as check excessive action of nerves in the form of opium, belladonna, chloroform, etc. Build up the health by increasing the force of the circulation. The agents are a thoroughly nutritious diet, wine frequently in small quantities, tincture of bark, iron, fresh sea air, change of locality and associations, agreeable mental occupation. Assure your patient she has no real disease, but the semblance only. Leave the functions of the alimentary canal to take care of themselves. The constipation incidental to a low innutritious diet, and an inactive life, will subside under the influence of a nutritious one; improved health will restore its functions. There is no real harm in a day's constipation; it is sometimes a good. At all events leave the bowels alone. With regard to the joint, rub in some blue ointment and extract of opium, in the proportion of one-third of the latter, and roll it firmly with a flannel bandage. Encourage moderate daily exercise on a level ground, on a carpet, or on a lawn. If the case is chronic don't be disappointed if the progress be yet protracted to weeks. The pain and the stiffness may subside very slowly, by virtue of their long possession by the joint; but you are in the right path, and rely upon it your patient's recovery will justify the sound principle of your treatment.

In the course of last year I was consulted by the family of a young lady of 18 years of age, living at a distance from London, relative to an affection of the knee from which she had been suffering for a period of ten months. The joint was stiff and painful; she moved about on crutches; there was no considerable amount of heat; and what alteration existed in the form and outline of the knee was due to the activity of the past treatment; the tissues had lost their natural softness and flexibility; the joint had been repeatedly leeched and blistered, and subjected to the application of liniments in variety of color and composition; an issue had been made on the inner side of the patella, which, judging from the cicatrix it left behind, had not been a small one, and the curative influence of which had not been discoverable during four months, at the expiration of which nature was allowed to heal it.

I considered this a case of hysteria, on the following evidence: the subject was a young lady of an hysteric age. She had sustained no sudden injury to the joint, neither blow, nor fall, nor strain. The malady was gradual and spontaneous. Had the disease been of the inflammatory class, the remedies would have probably long since cured

it. There was no appearance of disorganization otherwise than integumental. The pain was generally aggravated at the catamenial periods. Bending the joint afforded no evidence of disease within it, no grating or roughness of the cartilaginous surfaces. The pain varied greatly in intensity at different periods. This evidence was sufficient, and, to my judgment, conclusive. I strapped up her joint in an opium plaster. She took bark, and iron, and wine, and in a fortnight began to walk about without her crutches; but two months had elapsed before her recovery.

Many years ago, when I was less familiar with hysteric affections, I attended the case of a lady of 19 in conjunction with Mr. Stanley. We both deemed the disease to belong to the class of inflammation, and conjointly adopted the usual remedies so indiscriminately resorted to in all painful affections of joints. Many weeks elapsed without improvement, and I remember that we discussed with some anxiety, the probable issue in abscess, destruction of ligaments, absorption of cartilage, and ultimate amputation of the limb.

One day my patient informed me that her sister was going to be married, and that, cost what it might, she had made up her mind to attend the wedding. At this proposal I shuddered. Having expatiated, to no purpose, on the probable consequences of so rash an act, with all the force of language I could command, I determined to give stability to the joint for the occasion, and I strapped it up firmly with adhesive plaster. On the following day I visited her. She told me that she had stood throughout the whole ceremony, had joined the party at the breakfast, and returned home without pain or discomfort in the joint. Within a week her recovery may be said to have been complete.

This case first brought home to my mind the nature and the frequency of hysteric disease.

[Mr. Skey, after some preliminary remarks, proceeds to give a few examples of the less common forms of hysterical disease.]

A young woman, aged 24, was admitted into one of my wards at the hospital, who was the subject of difficult deglutition. She was a very respectable person in character and position, and had been for several years a much-esteemed servant in a good family, and was a young woman of some education. For two months previous to her admission she had complained of difficulty of swallowing her food. As the evil appeared to increase, the family medical attendant was consulted, by whom she was treated for a stricture of the œsophagus. One or more consultations were held on her case, and the œsophagus examined carefully by means of probangs and bougies. These instruments, however, failed to pass a given spot corresponding with the base of the neck, about one-third from the commencement of the tube. She had no local pain whatever. As the obstruction increased, nothing but semi-liquid food passed into her stomach, and this was only effected with a difficult and painful effort. She became emaciated by reason of defective nutrition, and at the time of her admission into the hospital was weak and somewhat attenuated in form. For many weeks she had taken no description of solid food, and even liquids passed the obstruction with difficulty. The malady now assumed a serious form, and with a view to additional advice she was sent to the hospital. The case was reported to me on her arrival as that of "stricture of the œsophagus," and I will tell you the preliminary train of thought that passed rapidly through my mind before I opened my lips to the students on the subject. Real stricture of the œsophagus is at all times a rare disease. When present it is almost invariably a cancerous affection. Cancer is a very rare disease at this woman's age. For so serious a malady as cancer she does not look ill enough; for though the presence of cancer of the breast occurring at a later period of life by twenty years may be for a time compatible with fair average health, cancer of the œsophagus stamps the constitution early. She is of an hysteric age, and though thin, she does not look absolutely ill. There is nothing of disease in her aspect, nothing that may not be referred simply to defective nutrition. The history of her case

was given me by her medical attendant, who was present on the occasion, and I had no hesitation in recording her disease as "hysteria." I declined the use of a probang or bougie which lay on the table before me, and I simply said, "We will endeavor to remove the obstruction without the aid of instruments of any kind." Her catamenial discharge had been regular throughout. I ordered her bark, iron, valerian, wine, milk with brandy—each to be given in the largest quantities at the shortest intervals *consistent with reason and moderation;* three times in twenty-four hours, enemata of thick soup with an ounce of brandy. These various agents were absorbed into her system with the greatest advantage to her health. Within a week she could swallow finely minced animal food, and in three weeks she ate a portion of a rump steak without difficulty, and was, in fact, convalescent. She was in high spirits at her recovery, and the only vexation she suffered arose from my refusal to pass a probang down her throat before she left the hospital. This I peremptorily declined to do, assuring her that a probang of rump steak was a far more efficient test of her recovery than any instrument in surgery bearing that name.

A young lady of 18, and of slight form, was brought to me from the country with gastrodynia. For upwards of a year she had suffered intolerable pain in the stomach on taking food of any description. She was much emaciated, and her pulse extremely feeble. Neither trouble nor expense had been spared in her treatment. Her family had consulted medical men of eminence in more than one metropolis, but the severity of the pain continued in spite of treatment. On entering the drawing-room, I heard the sound of suffering from an adjoining room, and I was told that my future patient was paying the penalty of a slight meal of arrowroot, of which she had swallowed a few table-spoonfuls only. Having intruded myself into the room somewhat unexpectedly by its occupants, I saw this young lady in a condition of great suffering, in the upright position, leaning her head upon her mother's shoulder and sobbing painfully. In the course of a quarter of an hour I had obtained some insight into her case, but I could not fail to observe that the mother habitually interposed replies to questions addressed to the daughter, and I explained to her the necessity of my obtaining the answers to my inquiries direct from her daughter. At my request she left the room. Up to that time I had but an imperfect knowledge of the case, but I then led the conversation to subjects which carried the girl away from her malady and all its associations. I spoke of her home and the scenery around it, of which I described the general characters, and enlarged on the beauty of the neighborhood, the lovely rides and excursions, etc., and in all of which I was tolerably successful, considering that at that time I had never seen it. However, the description was sufficiently accurate for my purpose, for it succeeded in distracting the young lady's attention from her suffering, and during the few minutes which this conversion occupied she was, to all appearance, entirely free from pain. She talked freely and cheerfully, and not the slightest reference by either of us to her former suffering. I then changed the subject by saying, "I think your pain has flown away," when she immedi ately resumed her crying fit and sobbed as before. She assured me she was in great pain, and the sensation had been but suppresssed. That this was a case of severe hysteria was highly probable, even had I gone no further with the evidence, relative to which the following thoughts occurred to my mind. What could be the nature of this pain if not hysteric? I was told by her family that pain followed the act of deglutition, not remotely or at any interval of one or more hours, but almost as immediately as the food could reach the stomach. This could not be dyspeptic or common gastrodynia, which waits on the process of digestion, and rarely occurs within a period of two hours of taking food. There is one disease only of the stomach in which pain follows the admission of food into it, and that occasionally only—viz.: cancer. Was it probable, or scarcely more than possible, that this girl of 18 could have been for so many months the subject of un-

detected cancer of the stomach? If cancer, could the attendant pain, so severe as it appeared at the commencement of my visit, be suspended by conversation? It was neither gastrodynia, the result of indigestion, nor cancer; and if not, what remains behind to elucidate the case? It could be nothing but hysteria, and hysteria alone could solve the mystery. But she had been treated for gastrodynia, and treated for cancer, but she had not been under treatment for hysteria, simply because these varieties of local hysteria have never yet fixed themselves on the attention of the profession. To tell a practitioner of the old school that a young lady was the subject of hysteria of the stomach would be to raise a smile at your expense.

It would be an unprofitable employment of our time were I to enlarge on the subject of the previous treatment. The remedies included, in different proportions and in varying doses, ammonia and other alkalies, under the mistaken supposition of acid secretion; opium in various forms, creosote, bismuth in small and large quantities, mineral acids, etc., etc.

How difficult it is to ascertain beyond all question the real value of many drugs in daily use amongst us. Although, in common with others, I have frequently employed the trisnitrate of bismuth, I have to this hour no conviction of its utility. This case did not terminate so satisfactorily as I hoped. That it was a case of hysteria admits of no doubt, but I had difficulties to contend with in the domestic management of the young lady. Although her symptoms remitted greatly under the use of remedies, she did not entirely recover in the brief period of three or four weeks during which she was under my care. I gave her small doses of ferrocitrate of quinine, two or three times a day a wine glass of port wine boiled with rice, and I ordered a plaster of the fluid extract of opium to be applied on the epigastrium. If coupled with these remedies, I could have separated the girl from her family, whose sympathies with her were far too redundant for her benefit, I think she might have been cured in one month. In a case of this kind a good domestic moral treatment is indispensable to success.

Hysteric affections of the ovaries are extremely common. Several of such examples I attended with my late friend Dr. Rigby. The cases I have seen have occurred in young females of between 20 and 25 years of age. They are characterized by deep-seated aching pain in the region of the ovary about two inches above the crural arch. My own observation would lead me to say that the right organ is more frequently affected than the left, but this is probably accidental. Like other hysteric affections, its severity varies with the constitutional health, mental and bodily. It yields but slowly to remedies, and, though mitigated, it often returns at longer or shorter intervals. I have applied opium locally with advantage, but an entire change of air, scene and occupation, combined with tonic treatment, are indispensable to recovery.

Dr. Samuel Wilks, Physician to, and Lecturer on the Practice of Medicine, at Guy's Hospital, says:

As in hysteria the nervous system is deranged, so every part of the body may suffer—the function of every organ may be disturbed, as well as the nerves themselves disordered in all possible manners. Let us look to some of these irregularities. First, the nervous system proper may suffer.

The motor system may be depressed or excited; thus paralysis is a very common hysterical symptom, affecting more especially the lower limbs. A leg cannot be moved, or both legs are the subject of paraplegia. As, in such cases, the cause is want of nervous energy, so you will perceive the peculiarity of these cases—that rousing of the will is often sufficient to put fresh vigor into the system and cure the complaint. A sudden

alarm has often cured the patient who has been considered as hopelessly paralyzed, and this gives us an insight into the correct treatment. I need not dwell further on this subject, as I have already, on more than one occasion, shown you the importance of the moral treatment of hysteria. A young lady has a complaint of an imaginary kind, and you visit her daily, and treat it as if it were a reality; the consequence is that it is perpetuated, and you have assisted in making it a perpetuity. You understand the real seat of the complaint—you attack that, and cure your patient. When I have had under my care here cases of paraplegia of years' duration, most assiduously treated by medicine, and at length cured by moral means, I cannot speak too highly of the method. These cases are not often difficult to diagnose, since in a real paraplegia the patient grows thin, bedsores appear, paralysis of the bladder and rectum may be present, and the patient feels ill, whilst in the case of hysterical paraplegia the patient remains plump; there is no trouble with the bladder, or, if any, it is retention of urine; the abdomen is tympanitic, bowels confined. The physiognomy of the patient and her surroundings sufficiently indicate the nature of the case. She has taken to her bed as if for the remainder of her days, and all is arranged accordingly—the stitching, the embroidery, the religious books where they can be comfortably reached, and she generally receives more sympathy from the clergymen and the lady visitors than do cases of real illness. The fact is that there are no painful and loathsome circumstances attending her case, and, from her conversation and industry with her hands, it is regarded as an "interesting" one.

Then, besides loss of motion, there is perversion of motion, and we witness sometimes, as a result of hysteria, some of the strangest movements which you can conceive. These are not of that irregular kind which we witness in chorea, but are usually of a rhythmical character; thus, instead of the body or arms being constantly writhed about in various directions, they are more slowly or regularly bent in a given manner. Thus a girl was in the clinical ward two years ago, who sat in a chair, and was constantly bending or bowing forward, as if saluting all those present. This continued for several months before she got better. In this case, as in all others, the greatest discomfort was produced by the use of any forcible means to restrain the movements; the cause lies in the centres within, and no approach to a cure is produced by attacking the effect. In several other cases the arm is in constant and regular motion, as if acted on by clockwork. This form has received the name of malleation. I remember a case of Dr. Barlow's, where the woman had constant quick breathing, and, what is remarkable, every inspiration occurred with a beat of the heart. This continued for weeks. I have quite lately been visiting a child who has died with this form of hysteria. After having various strange symptoms for some months, she took to sitting at the side of the bed, and having some person or object before her which she could continually keep thumping with her fists or head all day long. Any restraint only added to the irritation. Chloroform, opium, conium, and other remedies, in large doses, produced only a temporary effect, and she at last died utterly exhausted, and wasted almost to a skeleton. There was no disease found in the brain.

Then, again, we meet with permanent spasm as an hysteric symptom, seen more especially in the hand, which is firmly clenched, the tendons becoming rigid and the muscles contracted when the hand is forcibly opened. Then, again, the whole body may be affected after the manner of tetanus. This is more often seen in an acute attack of hysteria, but the lockjaw may remain as a very troublesome and constant symptom. I draw your attention to the fact, for it requires often all our acumen in order to distinguish a real disease from an hysteric one. Then, also, you may have that remarkable condition known as catalepsy. This in its purity is not very common, although I have seen two cases of it in the hospital. One of my patients would sink into a kind of swoon

or deep sleep, during which condition she would stand perfectly still in the middle of the ward, or, if in bed, would remain in any position in which you chose to place the body. Minor degrees of the cataleptic state are frequently met with, and not uncommonly in the epileptic of both sexes, especially after the occurrence of a fit. During the drowsy stage which follows, you will frequently find that the patient's limbs will remain in any posture in which you place them. You will observe, in fact, that the whole nervous system is deranged in hysteria. You will have evidence of irritation of the cerebro-spinal system in the movements I have mentioned, and in the strange mental vagaries; then also of the deadening of the centres, as seen in the paraplegia and in this disposition to lethargy. We are sometimes called in to a person lying perfectly insensible, and apparently as if near her end, but it is a mere phase of hysteria. An extreme form of this condition, when continued, is usually styled trance. The whole nervous system may be so lowered in tone that the person lies helpless and insensible, but the functions of life slowly go on. This state may last for a great length of time.

Then as regards the nerves of sensation, it may be said that invariably these are in some way altered in hysteria. More commonly there is hyperæsthesia of some of the senses. The patient cannot bear the light, or the least sound troubles her, but more usually it is the common sensation which is affected. Thus, sometimes no part of the body can be touched without the patient shrinking—I mean the body proper, as the chest and abdomen. Often it is some particular part, the more usual spots being those which are tender in many persons when their "nerves are low," as the middle dorsal vertebræ, the vertex, and the left side. You will find many nervous persons flinch when you touch them in these places. Then there may be some particular spot to which the whole attention of the patient is directed until that place is believed by her to be the seat of actual disease; I allude to the hysterical breast of Astley Cooper and the hysterical joint of Brodie. It is not always that the patient complains of pain, but an exquisite tenderness when the part is touched.

Then, again, there is the opposite condition of anæsthesia, where, owing generally to some violent commotion of the nervous system, the sensorium is thrown into a lethargic state, and the senses are sealed. A girl to whom I was once called received a great fright, had an hysteric attack, and fell into a state of lethargy; during this time she appeared to have lost altogether the sense of touch. The absence of sense of pain whilst that of touch remains I have already referred to, and is very commonly met with in hysteric women.

Now, besides this hyperæsthesia or oversensitiveness, our hysteric patients complain of and suffer pain. You must not think, because your patient is hysterical that she does not feel pain, for assuredly the suffering of many hysteric women is real. There has been, and still is, much controversy as to the seat and cause of these pains. Are they merely subjective, and due, as is the hyperæsthesia, to a morbid sensibility of the sensorium, or have they a local seat? and, if the latter, are they situated in the nerve and neuralgic, or in the muscle and myalgic? We have had writers who have contended strongly for one view or the other, but in all probability both are correct. I think however, we are much indebted to those physicians, whom I have before mentioned, who have directed attention to the frequent existence of myalgic or myosalgic pains. Thus, the pains in the side and in the head so frequently met with are said to be muscular, and more especially the pains which occur in the chest or abdomen. Two good cases of the kind I now have under my care in Mary Ward. The one a young girl, who lies in bed or sits in a chair, leaning forward, complaining of great pain at the epigastrium. She cannot bear it touched, and says she feels as if a load were oppressing her, and which will presently suffocate her. She is sometimes so bad that her mother thinks

she will die, but at the same time she is well developed, stout, and has apparently no real disease upon her. The other case is that of a woman well known to all students on account of the trouble which she has imposed upon them. Before she came under me she was in charge of one of my colleagues for several months. Her complaint is a most excruciating pain at the left side of the abdomen, which draws her double, and which hitherto has not succumbed to the medicines which have been taken in vast quantities. The only relief she has obtained has been by the subcutaneous injections of morphia, which have now been practiced for many months. The woman is in good condition, and does not look as if she suffered from any organic disease. On examination of the abdomen, the left side is full, rather rigid, and highly sensitive when touched. She complains, when the paroxysm of pain is on, of a most distressing bearing down and irritability of the bladder. She stated that she had passed blood in her water, and thus the case was treated as one of calculus of the kidney and ureter. At the present time opinions are divided between this diagnosis and one of hysteria, where the pain is due to a spasm of the abdominal muscle. My own opinion inclines to the latter view, perhaps being somewhat prejudiced by the fact that the great master Sydenham takes such a case as illustrative of one of the forms of hysteria, and which I will read: "When this disease seizes one of the kidneys, it plainly represents, by the pain it causes there, a fit of the stone, and not only by that sort of pain and by the place it rages in, but also by violent vomitings which accompany it, and also for that the pain sometimes extends itself through the passage of the ureter, so that it is very hard to know whether these symptoms proceed from the stone or from some hysterick diseases, unless perchance some unlucky accident disturbing the woman's mind a little before she was taken ill, or the vomiting up of green matter, shows that the symptoms rather proceed from an hysterick disease than from the stone. Neither is the bladder free from this false symptom, for it not only produces pain there, but it also stops the urine just as if there were a stone, whereas there is none. But this last kind seizing the bladder happens very seldom, but that which resembles the stone in the kidneys is not so rare."

Then, besides hysterical pains, we have disturbances of all the various organs of the body. Palpitation of the heart is very frequent. Then the breathing may be affected, and we have a kind of nervous asthma. The larynx may be affected; at one time there is a want of power to articulate, and neurophonia is one of the commonest symptoms of the hysteric condition. At another time the larynx is over-sensitive, and we have that troublesome and most annoying symptom, the hysteric cough. Some, however, have considered this due to a kind of chorea or spasm of the diaphragm. You may recognize it by the loud hollow or barking character, want of expectoration, and any evidence of disease of the chest, or, to give the description in the words of Sydenham, which is both precise and accurate, "sometimes it (the hysteric disease) seizes the lungs, and the patient coughs almost without intermission, but expectorates nothing; and, though this sort of cough does not shake the breast so violently as that which is convulsive, yet the explosions are much more frequent."

Sickness is one of the most troublesome and obstinate of all hysteric disorders, because the organ, having got into the bad habit of discharging its contents upwards, can with difficulty be broken of it. It is remarkable that, in these cases of daily vomiting, the characteristic of the hysteric condition, the plumpness or absence of emaciation still persists. One mode by which we diagnose such cases as hysteric, is that no medicine is of any avail; in real disease, even in such organic maladies as cancer, our ordinary remedies afford relief, but here the cure must be attempted through the nervous system. I believe the best method is to starve the patient for a while, or to use injections, so as to

preserve the stomach in absolute quiet for some days, and then to commence with the smallest quantities of food.

The bowels, again, are, to use Sydenham's expression, seized upon by hysteria. Thus, prolonged and obstinate constipation is a not uncommon phase of the disease. This is only to be cured by the medical man having his patient well in hand, and by letting her know that he is quite aware of the want of importance of her malady. The regular plan is for such a patient, like others of the kind, to be taken from doctor to doctor, who write the usual prescriptions, and with the usual results. The influence, which can be produced on hysterical patients by physicians and attendants, is well seen by some of the cures which occur under the direction of one of our "sisters," who introduces herself to her patients with "No nerves in Esther Ward."

As regards the nervous influence on the kidneys in the production of a large amount of water, the fact is one of importance in a diagnostic point of view. Sydenham says: "Among all the symptoms, which accompany the disease, this is the most proper and almost inseparable—viz., a urine, as clear as rock-water, and this hysteric women evacuate plentifully, which I find by diligent inquiry is in almost all the pathognomonic sign of this disease, which we call hysteric in women, and hypochondriac in men; and I have sometimes observed in men that presently after making water of a citron color (yea, almost the next moment), being suddenly seized with some violent perturbation of the mind, they presently void water as clear as crystal, and in great quantity. Three years ago, a nobleman sent for me, who seemed to be suffering from an hypochondriac colic. Visiting him one day, I looked upon his urine, which was of a citron color. He was then merry and cheerful, and said he had a craving appetite; but one, coming in at that very moment, vexed him so much that suddenly being taken ill, he called for a chamber-pot, which he almost filled with urine as clear as crystal."

Indeed, if I were to detail all the disturbances to which the body is liable in hysteria, I might occupy you for a month, or, to quote Sydenham once more, "nor is this disease only frequent, but so strangely various, that it resembles almost all the diseases poor mortals are inclinable to. For, in whatever part it seats itself, it presently produces such symptoms as belong to it, and, unless the physician is very skilful, he will be mistaken, and think those symptoms come from some essential distemper of this or that part, and not from any hysteric disease."

I can scarcely tell you how to treat these people. Occupation and diversion for the mind are, no doubt, the most essential elements in any treatment, but they are just those which you cannot enforce. The worst part of the therapeutical system is this, that, not only will the patient not take your advice, but by prescribing for him, you are assisting in perpetuating his illness. You might think that a patient, who was always ailing and got no relief, would not trouble medical men any further, but it is very remarkable that it is that very man who takes our physic. He will sit down and tell you of the number of medical men he has seen, and show you a bundle of prescriptions, declaring that they have done him no good, and yet he will ask for another.

Case of general hysterical paralysis treated by the continuous galvanic current, under the care of Dr. Savage, at the Samaritan Free Hospital, London:

An unmarried woman, aged nineteen, was brought to the hospital by her mother in September last, to ask the advice of Dr. Savage. She had always been in indifferent health, and during the last three years gradually lost the power over her arms and legs

to such an extent that she is scarcely able to walk even when supported, and entirely incapacitated from doing any work whatever. She first menstruated at fifteen years of age, but has always been very irregular, and the discharge very pale and slight. Sixteen months ago the catamenia ceased altogether, and from that time she became nearly idiotic. At present she is very listless, has a vacant look, and considerable dilatation of both pupils, more especially of the left one. The left iris is scarcely at all influenced even by a strong light. Her voice is almost entirely gone; she can only speak in a faint whisper. She is frequently troubled by pain in the head and the back. Her hands and feet are always quite cold. She complains of sickness in the morning, total want of appetite, and constipated bowels. She has had hysterical (epileptiform) fits. She has been under medical treatment for a long time, but without any benefit.

Seeing this condition of the patient, Dr. Savage consulted with Dr. Althaus, with the view of applying some form of galvanic electricity in order to rouse her nervous system. The latter gentleman made a most careful examination of the state of sensibility all over the body, and found that there was nearly complete anæsthesia of the whole left side, including the conjunctiva. On the right side the loss of sensation was not so much marked as on the left; but the prick of a pin was only felt as if it were a touch by some blunt instrument, and the examination by Weber's compass-æsthesiometer did not lead to any results, as the patient could nowhere distinguish whether she was touched by one point or two. The muscles appeared to be very badly nourished, but they contracted tolerably under the influence of the electro-magnetic current.

In cases like the foregoing, the application of the continuous galvanic current, such as produced by a large number of cells of Bunsen's or Daniell's battery, feebly charged, generally proves curative. It is a matter of doubt whether the current acts directly on the spinal cord, as is asserted by Professor Remak, or whether it merely acts on the nervous centres by reflex action from the sentient nerves of the skin. The latter opinion is held Dr. Althaus, who thinks that the resistance offered to the passage of the current by the bones and membranes enveloping the nervous centres is too great to be overcome by a current of such tension as it is safe to apply in the human subject. The principle of reflex action, moreover, is quite sufficient to explain the physiological and therapeutical action of the continuous current, so that it is not necessary to go out of our way and assume principles of electric conduction for the human body different from those which obtain for other physical bodies. However this may be, thus much is certain—that the continuous current, if applied in a proper manner, has a distinct action on the nervous centres, such as is not possessed by the interrupted current. In cases, therefore, where the affection proceeds from a lesion of the nervous centres, the continuous current may be used; while for local ailments invading peripheral nerves, the interrupted current is more beneficial.

In the case just mentioned, a current of from forty to fifty cells of Daniell's battery was sent in an inverse direction to the spine, from the nape of the neck downwards to the sacrum, for ten minutes. The operation was repeated twice a week. The pain caused by this proceeding is very insignificant in the majority of cases, and to some patients the sensation is positively pleasant. After six weeks' treatment in the way described, the patient was so much improved that she could walk three miles at a time without support; she could dress and feed herself; was able to do heavy work about the house; had always warm hands and feet; the voice had returned; the bowels acted regularly; and she was cheerful, and took an interest in everything relating to her affairs. The pupils now were quite normal. An examination by means of the æsthesiometer showed that sensation had been quite re-established on the left as well as on the right side. She

was discharged on November 19th, being then in perfect health, with the exception of the amenorrhœa, which still persisted, and an occasional feeling of sickness in the morning.

In this case the disorder was evidently of a merely functional character; but cases which are at present under Dr. Althaus's care seem to show that even in severe structural lesions of the cord and its appendages, the continuous galvanic current, if properly applied, produces highly satisfactory results. One of the cases is that of a girl, aged thirteen, who six years ago had meningitis spinalis lumbaris, contracted by sitting in winter on a cold door-step; and who having become completely paralyzed in the lower extremities, was admitted into Guy's Hospital, under the care of Dr. Gull. She remained in the hospital nine months, but without in the slightest degree recovering the use of her limbs. In October last she was sent to Dr. Althaus by Dr. Leared, under whose care she had been for some time previously. When she was first brought under the influence of the continuous current the paraplegia was complete, the patient being perfectly helpless, and the legs being wasted to the last degree. She is now so far improved that she can move her legs in all directions; and although she is not yet able to stand without support, Dr. Althaus holds out the expectation that by continuing the treatment she will entirely recover. The bulk of the legs has considerably increased although no local application of the current to the legs has been made.

The continuous current also proves beneficial in what has been recently described as "ataxie locomotrice" by Duchenne, but which is nothing else than the disease long known to the profession as atrophy of the posterior columns of the cord, and described by Romberg as "tabes dorsalis."

CHAPTER XXI.

EPILEPSY.

Epilepsy is a functional disorder of the nervous centres, the phenomena of which morbid state consists in seizures, generally sudden in their invasion; preceded, as a rule, by a well marked prodromal period; characterized by loss of consciousness (coming on suddenly) and attended by peculiar involuntary muscular movements which are highly spasmodic and convulsive in nature.

Epileptic paroxysms may properly be divided into three stages. In the first stage there is sudden and complete loss of consciousness, tonic contraction of the muscles all over the body, those of the face and neck being affected by spasm first. All the limbs are rigid and all the muscles work convulsively. Respiration is impeded or arrested, and with this arrest occurs a groan or smothered cry. Pallor of the face occurs, followed by redness or duskiness of the surface

of the skin, in some cases, while in other cases, the pallor does not occur at all, duskiness of face being present throughout the entire paroxysm. The pupils are dilated at the commencement of the attack. The pulse is usually small, and at times imperceptible, while the carotid arteries throb and beat violently.

In the second stage the unconsciousness continues and is persistent; clonic spasms are almost universal, during which the jaws are champed together and the tongue is bitten, the breathing is laborious and violent, and the patient often foams at the mouth. In the second stage, also, the dusky redness of the surface increases, and the pupils oscillate, the pulse is throbbing and labored, and the heart beats tumultously.

There is a jaded, exhausted state of the whole system in the third stage of the epileptic fit and the patient lapses into the after stage of stupor and exhaustion. There is lassitude and stupor with headache for some hours succeeding a paroxysm. Epileptic paroxysms may occur, in which there is loss of consciousness without evident spasm. There may be, also, a loss of consciousness with local spasmodic action. The cause of epilepsy is preeminently hereditary taint, by which I mean more particularly, that in tracing back the ancestry of the patient, we shall almost inevitably find that there has been an hereditary proclivity or predisposition to nervous disease upon slight exciting causes. That, in other words, there is a family neurosis which has manifested itself in various generations by insanity, phthisis, inebriety or idiocy. Epilepsy, also, is caused sometimes by excessive mental anxiety, to which has been superadded a sudden fright. Epilepsy appearing after the age of 21 years is generally caused by syphilis, and we treat the syphilis with large doses of the iodide of potassium, with, perhaps, mercurials added, and the epileptic convulsions disappear. The syphilitic neuroses are not very rare, but are very often overlooked. The centric causes of epilepsy are peculiar formations of the head, ossific particles in the dura mater, and the development of tumors. There is no necessary relation existing between epilepsy and mental deterioration. In a little over one-half of my cases of epilepsy, I have observed this deterioration to a greater or less extent.

When attacks of epilepsy appear after puberty, there is probably more danger to the mental integrity of the patient, than when the epilepsy is developed previous to that time. It is difficult to state with any degree of accuracy as to the periodicity of epileptic seizures.

Most patients will tell you that their attacks occur either every day, every week or every month, and there are a few who say that they never know when to expect an attack. In women, it is not infrequent to see the attack appearing at the time of menstruation. Epilepsy may be complicated with epileptic mania. There is generally no warning either to the patient or physician of this very furious and dangerous form of mania. The history of the two following cases which occurred in my practice serve to illustrate the general nature and character of such attacks. A lady of twenty-five years of age was placed under my care with epileptic mania. She had had a great many attacks of epilepsy which were preceded and followed by attacks of maniacal excitement, which rendered her a dangerous patient. She had been under restraint many times. About one month after being placed under treatment, she became very noisy and excited, as was her habit before her fit, and threatened to kill her attendant. Her eyes were suffused, her mouth dry, her pulse 140, and her tongue thickly furred. She was put on one-drachm doses fluid extract of ergot, three times a day. After taking the ergot for two days, she became quiet, and the epileptic seizure which followed was very mild, as compared with preceding ones. The ergot was continued and combined with sodium bromide, the latter in 30-grain doses thrice daily, and this combination administered steadily for some months. Since the commencement of the treatment, with the exception of the first attack, there has been no return of the maniacal excitement. The fits have decreased in frequency and intensity, and are not followed as formerly by maniacal excitement.

The second case was that of a gentleman affected with epileptic mania. He was a strong muscular man and had been subject to epileptic fits for years. For a period of from a week to two or three days preceding the fits he was very furious and unmanageable, and required to be restrained. He was also accustomed to have a period of maniacal excitement following the epileptic seizures, which lasted for a variable period, during which time his pulse would range from 100 to 120, and the face would be deeply congested. He was put on one-drachm doses of fluid extract of ergot with thirty grains of bromide of sodium thrice daily, and this continued for a period of two months. The fits decreased in frequency and intensity, and the maniacal excitement entirely disappeared.

Diagnosis.—With regard to the diagnosis of epilepsy, it is generally very easy to distinguish between epileptic fits and other convul-

sions. In cases where epilepsy is simulated, the entire absence of dilatation of the pupil will serve to distinguish between the real and the feigned disease. Attacks of syncope may sometimes be mistaken for paroxysms of *le petit mal*, but in epilepsy, the loss of consciousness is complete and sudden, the recovery is very rapid and there is no remembrance of the attack. These points will enable the young practitioner to distinguish between the two. We may distinguish between hysterical epilepsy, or convulsions occurring in hysterical women, characterized by epileptiform paroxysms, by the distorted features, bitten tongue and dilated pupils of the genuine epileptic paroxysm. The pupils in exceptional cases of epilepsy are said to be contracted. The convulsions of children dependent upon worms, teething or indigestion not only can be easily traced to these sources of irritation, but they disappear upon the removal of the exciting cause. They differ entirely from epilepsy in that the invasion is not sudden and the paroxysm is much shorter in duration. There is not complete unconsciousness as in epilepsy and there is no stupor of any consequence after the convulsions. There may be induced by sunstroke and intemperance at times, an epileptiform neurosis which may exist for a long time in an undeveloped or masked form, and this neurosis is very apt to be connected with both homicidal and suicidal mania.

Such attacks are often noticed to occur periodically for some time before the access of genuine epilepsy. I have often witnessed, in cases under my charge, abortive or incomplete epileptiform attacks, where there were no convulsions, and where there was no complete loss of consciousness. I have noticed in such cases either a momentary terror, slight incoherence, a gust of passion, or a mental blank, the patient, perhaps, stopping in the middle of a sentence. The patient would be himself again, quite unconscious of what had happened to him. Accompanying this confusion of ideas; there may be, as I have remarked, instantaneous impulses, either of a suicidal or a homicidal nature. During seizures of epileptic vertigo, persons may perform actions and even speak and answer questions automatically. There are numerous examples in the works of Hughlings Jackson, Maudsley, Russell Reynolds, Trousseau and Hammond, proving that, while in this unconscious state, persons can progress from odd or eccentric actions to deeds of violence, suicide or murder, being unable to remember the circumstances afterwards, and therefore irresponsible for their actions. This class of persons I have always found irri-

table, easily excited, very emotional, without adequate external cause, easily losing their train of thought and often unable to collect or fix their thoughts.

Prognosis.—The prognosis may be considered unfavorable when the following conditions exist: 1. When the disease is of long standing and idiopathic. 2. When hereditary taint is present. 3. When there is decided mental failure. 4. Violence of fits, frequency of recurrence, and an increasing bad effect left behind fits, are all unfavorable omens. I have, however, in some cases of long standing, and with frequent seizures and some mental failure, been agreeably surprised in curing my patients by putting them on the strychnia treatment, commencing with $\frac{1}{30}$th-grain doses, and using electricity in the shape of general faradization. These were anæmic cases, in all of whom the bromides had been pushed to excess by the family physician with very little appreciable benefit to the patient. The strychnia acts, as I shall show further on under the head of "Treatment," *by keeping the vessels of the brain in a state of permanent relaxation*, thus preventing the access of the epileptic paroxysm, *the basis of which access is a vascular tonus which causes a sudden anæmia of the brain.* Professor Roberts Bartholow, of Philadelphia, has reported some excellent results from the strychnia treatment in cases which had resisted the bromides, and my own experience has been very satisfactory and has been employed by me for several years.

Pathology.—It seems to be very probable that, owing to functional disturbance of the vaso-motor nerves which are distributed to the cerebral bloodvessels, we have, during an epileptic paroxysm, primarily, the vascular tonus just referred to causing sudden anæmia of the brain, immediately followed by great congestion and hyperæmia. The whole motor tract of the cerebrum and also of the spinal cord is undoubtedly connected with the production of epilepsy, and probably, also, the motor nuclei in the medulla oblongata and on the floor of the fourth ventricle, and the corpus striatum, as one of the centres of motion, is also concerned. Sclerosis and atrophy of the ascending parietal, and foot of the third frontal convolutions, and of the cornu ammonis, have been found, *post-mortem*, in epileptics. It is now supposed that, from the part of the body first and principally affected by convulsive seizures, we can diagnosticate with certainty the cortical centre primitively and principally affected. The epileptic paroxysm

seems to consist of a sudden discharge, starting probably from a limited region in the nerve-centres, which, by its action on the sensorium destroys consciousness, and by its action on the motor system, produces perverted or arrested action. As to the relation which either the cerebral anæmia or hyperæmia bear to the paroxysm of epilepsy, we are ignorant farther than I have already stated. The pathology is very obscure and very difficult to explain.

Treatment.—During the epileptic paroxysm we can do nothing but prevent our patient from injuring himself and removing all pressure from the neck and abdomen. When the attack is preceded by an aura of sufficient duration we may avert a large number of fits by various means. Inhalations of nitrate of amyl, chloroform, or ammonia will often cut short an attack; or the internal administration of ether, wine, or sal volatile. Sometimes a ligature or garter of blister applied between the starting-point of the aura and the trunk will avert the paroxysm. A patient under my care who had a warning sensation, lasting for some time, proceeding from the epigastric region, was in the habit of drinking a large quantity of ice-water, and in this way averted a great many paroxysms.

With regard to the treatment of the general condition upon which the epilepsy depends, there are innumerable remedial measures which have been tried with more or less success.* Trousseau recommends the use of belladonna in pill form, the patient taking $\frac{1}{5}$th of a grain of the extract, or in its place a pill containing $\frac{1}{100}$th of a grain of atropine. During the first month one pill daily is to be given, and a pill per month added until the patient takes from five to twenty pills daily. The pills are given in the day or at night, as the fits are diurnal or nocturnal. On the principle that there is over-excitement of the central nervous system, sedatives, and notably the bromides, have been administered, and with some success. In some cases complete cure has followed this treatment, but more often a temporary arrest of the attacks. In cases of ordinary epilepsy, where the bromides have not been used, I employ the following:

* Dr. Powers of London, in treating 562 cases, found that the attack ceased in 241 cases while under treatment. In 266 cases, improvement, short of arrest, was obtained, the fits being reduced to $\frac{1}{20}$, $\frac{1}{30}$, $\frac{1}{50}$ and even to $\frac{1}{200}$ of their frequency and severity. In 55 cases but little or no improvement. Dr. J. Hughes Bennett in treating 41 cases found that in 22 per cent the paroxysms were completely checked during the whole time of treatment. In 92 per cent the seizures were either entirely arrested during the observation or greatly modified in frequency and severity.

℞. Sodii bromidi, ... ℥ j
Ammon. bromid., ... ℥ ss
Aquæ, ... ℥ vij
M.

One teaspoonful contains 15 grains of the bromide, and I order a teaspoonful thrice daily, to be gradually increased until brominism, as indicated by the disappearance of the faucial reflex—the most delicate sign of brominism—is established. I guard against the injurious effect of the bromides by administering 3 grains of quinine daily, which assists the efficiency of the bromides and wards off anæmia. Chloral, in weak subjects, is preferable to the ammonium in the anti-epileptic mixture, and may be substituted in the same proportions. This formula was first suggested by Dr. Séguin, of this city, and is, I think, quite an improvement on Brown-Séquard's. When the fits are nocturnal the largest dose should be taken before retiring and the day doses proportionately decreased.

A certain proportion of cases will improve under this treatment, and be cured in the course of time. I do not consider a case cured, however, until at least a year and a half to two years have elapsed without the occurrence of a paroxysm. In the cases that apply to me for treatment, or to which I am called in consultation, who have taken the bromides to excess without benefit, and have been rendered very anæmic by the course of treatment, I commence with strychnia in $\frac{1}{30}$-grain doses, thrice daily, and gradually increase until physiological effects are produced, at the same time using general faradization, and I have seen very rapid improvement and cures take place under this course of treatment. Mental and physical exercise, the latter especially, are of great importance to the patient; also a regular plain diet, with little or no meat. The patient should take cold sponge-baths, followed by friction with a Turkish towel or flesh-brush, and live as much as possible in the open air. As I have intimated, I have found the application of electricity in the form of the induced current of signal service in several cases, and attribute a cure to it combined with the strychnia treatment in three instances. I also use a pill containing $\frac{1}{10}$ of a grain of phosphide of zinc, daily in each case, and pay great attention to the general health of my patients.

One of these cases was a girl of twelve years of age, whose fits occurred every few days. I regulated her diet, took her out of school, had her take daily regular exercise in the fresh air, and employed general faradization for her daily, conjoined with strychnia

in $\frac{1}{80}$-grain doses, thrice daily, and phosphide of zinc $\frac{1}{10}$ grain, thrice daily in pill. Her fits soon began to decrease in frequency and intensity, and her general health also improved. She lost the dull, meaningless expression which had rendered her almost repulsive, and her face took on a bright, healthy, happy expression. The fits, after a period of four months ceased entirely, and have never reappeared although five years have elapsed.

The second case was that of a man whose history of himself was so discouraging that I told him at the outset that I did not expect or hope to do more than alleviate his symptoms. His fits were nocturnal, and he had frequent "*luny spells*," as he called them, during which he was oblivious to all his surroundings. The mental deterioration was very marked, and I thought him a hopeless case. To my utter surprise he began to improve after a few weeks of the strychnia and electricity treatment, and came to me telling me with great joy that he had no fit the preceding night. His wife, who occupied the same room with him, corroborated his statement, and said that for the first time in many months he slept like a child. The treatment was kept up steadily for three months, and at the end of that time the fits had entirely ceased, the mental deterioration had disappeared, and my patient expressed a desire to resume his former employment. I consented, but ordered him to keep on the phosphide of zinc, with strychnia in small doses, until ordered to stop, and to report to me weekly. From that day to this, some three years having elapsed, he has had no recurrence of his fits. I do not know in how great a proportion of cases such treatment would avail, but I imagine in many, where the bromides have proved inefficacious and where the patient is weak and anæmic.

As I have intimated, I regard the basis of the epileptic attack to be the vascular tonus which causes the sudden anæmia of the brain, and in my treatment of epilepsy, especially in those cases where the bromides have not produced marked improvement, but have produced an anæmic condition, I am constantly obtaining the most gratifying results from the use of strychnia, commencing with $\frac{1}{30}$-grain doses. It *cures* epilepsy in connection with my other treatment, by keeping the vessels of the brain in a state of permanent relaxation, and improving the nutrition of the brain and cord, and thus preventing the sudden anæmia of the brain caused by the vascular tonus.*

* Dr. Wilks of Guy's Hospital, London, England, has used with success nux vomica and zinc and reported his success in 1869. The author was not aware of this at the time,

Sometimes the monobromide of camphor, after the failure of most other therapeutic agents, will diminish the frequency of the recurrence of the convulsions, and in my experience it diminishes the frequency of the recurrence of the *vertiginous* fits greatly, and the latter result is very desirable, as I am of opinion that the influenee of epileptic vertigo in inducing mental deterioration is more disastrous than that of the confirmed malady.

Dr. Clouston, of England, some time since made an extended series of experiments respecting the effects of bromide of potassium on a number of cases in his asylum—the Cumberland and Westmoreland Asylum—with the following conclusions:

"Twenty-nine cases of epilepsy, of old standing, all having the same diet and subject to the same conditions, were subjected to systematic treatment by bromide of potassium, after their normal condition as to fits, weight, temperature, general health, and mental state had been ascertained and noted. Gradually increasing doses of the medicine, up to fifty grains, three times a day, were given, and the treatment was continued for thirty-eight weeks, every particular in regard to the disease and their bodily and mental condition being noted every week during that time.

"The total number of fits taken by the patients fell gradually under the use of the medicine to one-sixth of their average number without medicine.

"The fits during the day were lessened to about one-twelfth, and those during the night to about one-third of the ordinary number.

"The reduction in the fits was not uniform in all the cases. In one case it amounted to 24 per cent., in one-half of them to more than 10 per cent., and in five cases there was no reduction at all.

"In one-fourth of the cases the fits were much less severe, in some being less severe while as frequent as before.

"In one-fourth of the cases the mental state was very greatly improved. Nervous and mental irritability and tendency to sudden violence were wonderfully diminished in those cases, and they were the worst of the patients in that respect. Attacks of epileptic mania

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1875, when he first commenced to successfully use strychnia and zinc in combination together with the induced current of electricity. Dr. Walter Tyrell, whose experience we give, has used strychnia successfuly since 1861. Both these observers, whose treatment I was unaware of in 1875, have therefore antedated me in the successful use of strychnia. Dr. Tyrell thinks it acts by deadening the condition of exalted sensibility in the medulla oblongata, which Van der Kolk considers the predisposing cause of the disease.

were diminished. In some cases the mental state was improved, while the fits remained as frequent as ever.

"The majority of the patients gained considerably in weight while the doses were under thirty-five grains three times a day. Their aggregate weight was greater at the end of the thirty-eight weeks than it had been to begin with, though it began to fall after thirty-five grain doses had been reached.

"The temperature fell somewhat until they got up to fifty grain doses thrice a day.

"The pulse gradually fell about seven beats up to forty grain doses, after that it rose, but not up to its usual standard without medicine.

"None of the patients suffered in their general health except five, all the others were benefited in some way except one.

"The ill effects produced by the medicine in those five cases were torpor of mind and body, drowsiness, increase of temperature, loss of weight, loss of appetite, and in three of them slight double pneumonia.

"The cases most benefited by the drug were very various as to the causes, number and character of the fits, age, and in every other respect. On the whole, the cases who took most fits benefited most.

"The cases in whom the medicine had ill effects had all taken fits from childhood, were all very demented in mind, and took more than one fit per week, but seemed to have nothing else in common.

"The diminution of the fits and all the other good effects of the medicine reached their maximum, in adults, at thirty-grain doses, three times a day, while ill effects were manifested when thirty-five-grain doses, three times a day, were reached. There seemed to be no seriously ill effects produced in twenty of the cases by fifty-grain doses of the medicine, thrice a day, continued for ten weeks. When the medicine was entirely discontinued in all the cases, the average number of fits increased in five of the cases benefited, to or beyond their original number in four weeks; in thirteen cases they remained considerably less. The total average during that time was a little more than one-half the number of fits which occurred in the second week after the medicine was discontinued."

Dr. J. Thompson Dickinson, M.A., Medical Superintendent of St. Luke's Hospital says:

[A great deal has been written upon this interesting subject, and much has been firmly established. The first real step in advancing our knowledge of the subject, was made

by Schroeder van der Kolk, whose researches were followed by those of Brown-Séquard.]

The following are the ideas which it is my intention to attempt to establish:

1. Epilepsy is a contraction of the cerebral capillaries and small arterial vessels; the order of its stages in an epileptic attack being, irritation of brain, either direct or secondary to exhaustion; contraction of cerebral capillaries and small arterial vessels; cerebral anæmia, and consequent loss of consciousness.

2. The muscular contraction and spasm, together with all the varying phenomena associated with epilepsy, are altogether secondary, and not at all essential or constant, but they are all manifestations of imperfect nervous (cerebral) control, or a loss of balance between the nervous and other systems.

It is perhaps unnecessary to prove loss of consciousness as the first subjective phenomenon of epilepsy, since it is on all hands admitted; or, as stated by Trousseau, it may be considered the pathognomonic sign of epilepsy. To whichever variety of the two great specific forms—*le petit mal* and *le haut mal*—any individual seizure may belong, we can always, by strict inquiry, find some amount of unconsciousness in the first stage. The absolute fixedness of this rule—which may almost be called a law of epilepsy—has been doubted, I know, by few. I shall endeavor to meet their objections further on in this paper.

The condition of anæmia is, strange to say, the one which was long unobserved; and, in fact, only within the last few years has it been noticed at all. The congested state of the vessels of the face and neck attendant upon epilepsy is secondary; but so much more striking is it, that for a long time it was the only condition of vascularity observed. The pallor of epilepsy is sometimes of considerable duration; but this is more particularly the case in *le petit mal*, the almost endless varieties of which were not until lately recognized as epileptic, and, consequently, as they were considered as fainting attacks, the attendant pallor made no impression on observers; usually, however, especially in *le grand mal*, it is fleeting. The fact of pallor, however, is an indication, though not a certain evidence, of cerebral anæmia. It would appear highly probable that the face and neck sympathize with the internal condition of the skull as regards sanguiniference; but further evidence is necessary, since, on simple principles of animal mechanics, if one set of vessels be empty, another set must be more or less full; and the question might be reasonably asked, why the surface-vessels of the head should not be the ones to take up the opposite condition to that of the cerebral. The question would, however, be specious, since it is the venous rather than the arterial vessels that receive the blood; but this is not altogether absolute. The best evidence that the surface vessels correspond with those of the cerebral is, that consciousness is lost during the anæmic state, while, in conditions presumably congestive, *e. g.*, the paroxysm of whooping-cough, consciousness never, in the true sense of the expression, disappears.

Animals that have died or been killed during a fit have always exhibited brains perfectly anæmic, blanched and bloodless. This is borne witness to by Schroeder van der Kolk, Trousseau, and Brown-Séquard, and has obtained in all my own experiments and observations.

3. Whenever cerebral anæmia is by any means brought about, loss of consciousness, is the result; *e. g.*, if pressure be made upon the brain or cerebral membranes of an animal, or if the brain be wounded, anæmia and loss of consciousness instantly result. In the case of an infant among the out-patients of Guy's Hospital, said to be epileptic, I made simple pressure with my finger upon an open fontanel, and produced the whole of the epileptic phenomena perfectly. An animal bled to death passes through all the stages of epilepsy before the final struggle. It is hardly necessary to multiply the evidence on

this point. It is essential, however, to demonstrate the fact of the contraction of the capilliaries and small arterial vessels as a result of irritation or exhaustion, as it is to this contraction that the anæmia and loss of consciousness are due.

Direct irritation, such as that already mentioned, viz.: pressure on the membranes or a wound of the brain, are always followed by instantaneous contraction of the smaller cerebral vessels, but, at the same time, the capillaries of the medulla oblongata become distended. This point is one particularly worthy of notice, and was first observed by Schroeder van der Kolk. If an animal be trephined, and a knife plunged into his cerebrum, the whole of that organ will become instantly anæmic, and its small vessels will be found contracted, while those of the medulla—particularly the capillaries—will be found full and distended. It is well to try this experiment on an animal, the subject of epilepsy, as the constant recurrence of the seizures permanently dilates the capillaries of the medulla. It must not be assumed from this that the blood from the cerebral vessels passes to the medulla. It is more likely that, on account of the sudden check to the circulation of blood in the cerebrum, the cumulative force of the arterial current endeavors to expand itself in the nearest channels, of which the medulla forms one; and the absence of resistence, owing to the yielding nature of its material, readily allows the dilatation, which continuously increases the longer the epilepsy is continued.

It thus is clear that, in the relation of cause and effect, the dilation of the capillaries must be included under the latter head, and must be considered as altogether secondary to the epilepsy.

As the actual pathological lesions associated with epilepsy, I may enumerate tumors involving surface, surface-abscess, tuberculous membranes, thickened membranes, adherent membranes, and atrophy, to which I may add, as a rare, though occasional condition, surface-softening, and perhaps softening of the cord. This synopsis is from an examination of the daily records of *post mortem* examinations at Guy's Hospital, extending over ten years; and to it I will add bony tumors projecting from the inner table of the skull and encroaching upon the surface of the brain; also ossific membranes.

Extensive disease may occur in the centre of the brain; but unless the surface be involved, the central pathology will not be associated with epilepsy as a concomitant.

The histories of clinical cases give unequivocal evidences of tumor and syphiloma, thickening of the cerebral membranes from alchoholism and blows, and hereditary transmission of both syphilis and nervous imperfection; while fright has sometimes been set down as a cause. It occasionally happens, however, that the physician will be baffled in every attempt to find out the particular predisposing cause in an individual.

I have already observed that any cause which tends to produce an anæmic condition of the brain is sufficient to induce convulsion, exampled in the sudden and direct depletion, as when an animal is bled to death; a more gradual drain, however, will produce the same result. For instance, menorrhagia may stand in the relation of cause to effect; also watery conditions of the blood, as in albuminuria, whether of morbus Brightii or of parturient women. Again, excess of urea, as well as poisons directly introduced into the blood, as atropine, narcotine, nicotine, will also stand in the same relation. Another and not uncommon cause is distant local hyperæmia, exampled especially in children who suffer from convulsive disease, as an affection secondary to disturbance of the digestive organs and the irritation of worms; exemplified also in the dentition of infancy, but in this latter case, as perhaps also in a minor degree in the former, the element of peripheral irritation must be somewhat taken into account. Irritation of the peripheral extremity of a nerve will produce epilepsy. A remarkable case was quoted by Dr. Brown-Séquard (reported by the late Mr. Standist, of Taunton); and I have seen more than one case of epilepsy traceable to carious teeth. The constant irritation of the ex-

tremity of a nerve exhausts the potential energy of the cells from which the nerve takes its rise, and produces a condition very similar to shock, whether physical or psychical. All forms of shock appear undoubtedly to determine the occurrence of epilepsy in some individuals; yet, with regard to the psychical variety, I would speak very guardedly. One case under my observation for some time was attributed to fright! A *post mortem* examination exhibited a surface-tumor. Another patient, the widow of an officer who was murdered before her eyes in the Indian mutiny, stated that she had been epileptic ever since the fright she received on that heart-rending occasion. She had, however, suffered from that time up to the time I saw her, more or less from menorrhagia. The epilepsy was always increased when the flux was augmented, and lessened when it abated. After a short treatment directed towards the control of the menstrual discharge, the epilepsy ceased to recur, and she has remained free from the attacks ever since.

Dr. Brown-Séquard, in the commencement of 1869, stated to the French Academy that, in continuation of his experiments in inducing epilepsy by section of the spinal cord, he had concluded that the greater part of the cord takes an active part in the production of convulsion, because he had seen attacks occur in the muscles innervated by a segment of the cord comprised between two sections. The fact, as stated by Dr. Brown-Séquard, has, however, very little real bearing on the subject of epilepsy, except to confirm the truth of the hypothesis that the convulsive movements of epilepsy are the result of loss of control.

Dr. Brown-Séquard further stated that the brain seemed to take no part in the convulsion, because convulsive seizures continued to be produced in epileptic guinea-pigs, in which life was maintained by artificial respiration after the brain had been removed. This fact at least tends to confirm the idea I proposed at the commencement of this paper, viz.: that convulsive movement in epilepsy is the result of a loss of cerebral control, or loss of balance of control between the cerebral and other systems. An animal with a bloodless brain—the effect either of direct depletion or of irritation from any cause—is in very much the same condition as an animal without a brain at all; and, therefore, there is not that discordance between clinical observation and the results of the experiments of Dr. Brown-Séquard which MM. Colin, Ricord, and Hardy, attempted to show, when Dr. Brown-Séquard's paper was discussed. Dr. Brown-Séquard stated that he had never been able to produce epilepsy by unilateral division of the cord in any animal other than the guinea-pig, except the cat. It is a fact worthy of record that I have induced epilepsy in the rabbit by unilateral section; I have also seen one case of epilepsy in a wild rabbit.

Dr. George Johnson, Physician to King's College Hospital, says:

To what extent do the phenomena of an epileptic fit admit of explanation? In a fully developed epileptic fit, there are two chief phenomena to be explained; these are loss of consciousness and convulsions. The loss of consciousness, until within a very recent period, has generally been supposed to be a result of congestion of the nervous centres, and especially of the cerebrum. But this explanation is inconsistent with the fact that the epileptic loss of consciousness comes on in a moment at the very commencement of the attack, when there is no evidence of congestion, and when the face is usually pale from anæmia. The congestion follows the loss of consciousness, and the explanation of its occurrence appears to be this: The convulsion implicates the respiratory muscles; the blood, therefore, being imperfectly aërated, is impeded in its passage through the lungs; it consequently accumulates in the right side of the heart and in the veins. The congestion, therefore, is a secondary venous congestion; and, at the time when this con-

gestion has reached its greatest height, there is often a commencing return of consciousness. Obviously, then, this congestion is not the cause of epileptic loss of consciousness. This retrograde venous engorgement is the cause of the ecchymoses beneath the skin and the conjunctiva, which often occur during a fit, and of the hæmorrhage into the substance or upon the surface of the brain, which happily is a much less frequent accident.

A number of facts point to the conclusion, *that both the loss of consciousness and the convulsions of epilepsy are the result of sudden and extreme anæmia of the brain.*

In man, and in most, if not in all, warm-blooded animals, a rapid and very copious hæmorrhage usually causes convulsions. Kussmaul and Tenner state (*On Epileptic Convulsions from Hæmorrhage*, New Sydenham Society, 1859) that, in numerous cases of dogs, cats, and rabbits, they observed, without a single exception, violent and general convulsions preceding death from loss of blood. In order to produce this result, the hæmorrhage must be rapid. If it occurs slowly, so that the vital powers are gradually consumed, death then occurs with swooning, drowsiness, and delirium, without convulsions.

The same observers found that an interruption in the supply of blood to the head of a rabbit, by ligature or compression of the arteries, produces epileptic fits as surely as hæmorrhage does. In about one hundred rabbits, they ligatured or compressed the carotids and subclavians, from which, be it remembered, the vertebrals proceed, and in every instance, except that of one very old, lean, and feeble rabbit, convulsions occurred. In order to produce convulsions, it was necessary to close all the four arteries which supply the brain. If but one carotid or one subclavian remained pervious, the animal was enfeebled and more or less paralyzed, but not convulsed. And again, if during the height of a convulsion the ligature is removed from one carotid, the convulsions generally cease immediately, and there is a sudden change from the most frightful spasm to complete relaxation of the muscles. The description of the convulsions thus artificially produced in these animals, shows that they were essentially the same as epileptic convulsions in the human subject. There was the dilated pupil, the tonic spasm, quickly succeeded by clonic convulsion, so violent as to throw the animal forcibly forwards to a distance of one or two feet, and sometimes even over the shoulders of the experimenter. These experiments suffice to show the fallacy of the explanation which Dr. Brown-Séquard and others have given of the clonic convulsions in man. It has been supposed that the clonic convulsions are a consequence of the circulation of black blood which results from the tonic spasm of the respiratory muscles. Now it is manifest that, in these animals with ligatured arteries, no black blood could reach their brain. In them, therefore, the clonic convulsion, as well as the preceding tonic spasm, must be due to want of blood, and not to the altered quality of blood in the brain.

These experiments obviously cannot be repeated on the human subject; but Drs. Kussmaul and Tenner describe the effects of compressing the carotids in six men. In all the face turned pale; the pupils first contracted and then dilated; the respiration became slow, deep, and sighing; then there was giddiness, staggering, and unconsciousness, and the patients would have fallen had they not been supported. "In two subjects, of weak intellect and moderately anæmic, in whom, notwithstanding the above symptoms, the compression was continued, a choking sensation, attended by vomiting and general convulsions, came on, which, however, did not attain an aggravated form; for, on withholding the compression, they disappeared in a few seconds." (*Op. cit.*, p. 28.)

Compressing the carotids does not, of course, entirely cut off the supply of arterial blood to the brain; but these experiments render it probable that sudden occlusion of all the arteries of the head will as certainly excite epileptic convulsions in man as in the lower animals.

There is a class of cases in which a sudden arrest of the blood in its passage through the lungs causes convulsions and speedy death. I mean cases in which the circulation is arrested by the admission of atmospheric air into the veins—cases of embolism of the pulmonary artery; again, cases in which the flow of blood through the lungs is stopped by the injection of certain salts into the veins; and, lastly, cases of acute apnœa. When animals are killed by blowing air into the veins, the breathing becomes hurried, the animal falls down, and usually dies in convulsions; the contents of the bladder and rectum being frequently expelled at the time of death. Dr. John Reid states that, "in a very few cases only, is death from this cause not preceded by convulsions." (*Physiological, Anatomical, and Pathological Researches.*) The immediate cause of death in these cases is the arrest of the frothy mixture of air and blood in its passage through the minute pulmonary arteries (the air rarely reaches the left side of the heart); and, as a result of this arrest, there is, of course, anæmia of the brain and of every other organ supplied by the systemic arteries.

In man, it appears that death from the admission of atmospheric air into the veins has been less frequently preceded by convulsions. Probably the chief reason of the less frequent occurrence of convulsions in the human subject is, that the amount of air accidentally admitted is less, and death, consequently, is less rapid than when air is forcibly driven into the veins of an animal. It would probably be found, on a careful inquiry, that the occurrence of convulsions in these cases depends upon the circulation being suddenly and completely arrested.

Convulsions are mentioned in only five out of fifteen cases collected by Amussat; but, Dr. Reid remarks, "several of the cases, as we might have expected, are very imperfectly reported; for it is not to be supposed that the surgeon or his assistants should possess the coolness and time to watch narrowly the phenomena, when their minds were agitated by the threatened sudden dissolution of their patient, and their attention distracted by anxious attempts to save him." For the same reason, the record of cases of pulmonary embolism is very imperfect; but, in some instances, it has been observed that death was preceded by violent convulsions; and Virchow noted, amongst the results of artificial embolism of the pulmonary artery in animals, convulsions and dilatation of the pupil.—*Des Emboles Pulmonaires.* Par B. Ball, p. 129.

Again, Blake found that an injection of a solution of soda or its salts into the veins of a dog, destroys life by arresting the flow of blood through the lungs. The left side of the heart is found empty and the right distended. Death occurs in about forty-five seconds, and is preceded by violent opisthotonos.—*Edinburgh Medical and Surgical Journal,* vol. liv., p. 343.

Blake attributes the nervous symptoms to the venous pressure on the brain, but they may, with much more reason, be attributed to the arrest of the arterial supply to the brain. When, from any cause, the blood is arrested in its passage through the lungs, it is obvious that distension of the systemic veins must have, as its necessary correlative, comparative emptiness of the systemic arteries; the one will be an index and a measure of the other.

Lastly, we have the convulsions which occur in almost every case of acute apnœa or sudden suffocation. It is generally supposed that the convulsions of apnœa are excited by the circulation of black blood through the brain, but they are more probably due to the rapid and extreme anæmia of the brain consequent upon the impeded transit of blood through the lungs. When the air is excluded from the lungs the circulation is rapidly arrested by the contraction of the minute pulmonary arteries. That this is the true explanation of the convulsions of apnœa is rendered highly probable by an observation of Kussmaul and Tenner (*op. cit.*, p. 75) to the effect that "the approach of convulsions in

strangulation can be accelerated if the arteries are simultaneously compressed." It is obvious that, if the presence of black blood in the brain were the cause of the convulsions, their approach would be retarded and not accelerated by compression of the arteries which supply the brain. The facts are consistent only with the theory that the immediate cause of the convulsions in cases of suffocation is a rapidly increasing cerebral anæmia, resulting from the arrest of the pulmonary circulation. Black blood, in so far as it is deficient in oxygen, is equivalent to no blood. Probably it is rather by its negative quality of being unoxygenized than by any positively noxious properties, that it is unsuited to maintain the functions of the brain. It is probable, too, that the minute cerebral arteries resist the passage of black blood, and so increase the anæmia of the brain. If the circulation of dark blood through the cerebral vessels would excite convulsions we should expect to find this symptom of common occurrence in cases of emphysema with bronchitis.

I have now referred to instances of epileptiform convulsions occurring under a considerable variety of circumstances, but all agreeing in this one condition, namely, that the convulsions are associated with a defective supply of arterial blood to the brain. Let us now proceed to inquire whether the phenomena of epileptic convulsions, as they ordinarily occur in the human subject, are consistent with the theory of anæmia. It is a matter of general observation that, at the very commencement of an epileptic fit, the face is pallid. There is anæmia of the superficial vessels, and with this there is probably associated anæmia of the intracranial vessels which supply the brain itself. The pallor is, in most cases, soon succeeded by lividity, owing to venous engorgement consequent upon the impeded respiration and pulmonary circulation. It is very remarkable that, while the face is pallid, the heart and the carotids are beating strongly. It is probable, therefore, that there exists some impediment to the flow of blood through the minute branches of the arteries. To explain this impediment Kussmaul and Tenner suggest that the minute arteries, both the superficial and the intracranial branches, contract so as to bar the passage of blood. Hence arise the pallor of the face and the epileptic convulsion. In some cases it is said that the face is more or less livid at the very commencement of the fit. The probable explanation of this is that the respiratory muscles are convulsed and there is a consequent venous turgescence before the spasm affects the facial arteries. The spasm of the *facial* arteries, though usually present, is obviously not the cause of the fit. The early implication of the respiratory muscles is clearly shown in those cases in which the "epileptic cry"—a result of spasm of the glottis—is the first indication of the fit.

Kussmaul and Tenner endeavored to support the theory of arterial spasm by experiment, and to some extent they succeeded. In each of three white rabbits they ligatured the two subclavians and one carotid; the cervical sympathetic was then exposed and galvanized, with a view to excite contraction of the arteries by the stimulus conveyed through the vaso-motor nerves. In two animals no effect was produced, but in the third rabbit the background of the eye became completely pale, the pupil dilated so that the iris could scarcely be seen, the neck was drawn back, and violent convulsions occurred. The electrodes being removed, the spasm ceased, the pupil contracted, and the background of the eye became red, but the animal continued in a swooning condition. After some minutes electricity, applied to the sympathetic nerve, produced the same effects as at first. A third attempt did not succeed.

The authors suggest that these experiments deserve repetition, with the view of rendering certain what at present is probable, namely, "epileptic convulsions can be brought about by contraction of the bloodvessels induced by the vaso-motor nerves."

According to this theory, then, epilepsy is a result of sudden anæmia of the brain; and

this anæmia, when not caused by hæmorrhage or by a mechanical impediment to the circulation outside the cranium, is due to an extreme contraction of the minute cerebral arteries. With reference to this theory of arterial contraction, all cases of epilepsy may be arranged in two distinct classes: 1. Cases in which the arterial contraction is the result of a purely nervous or reflex influence. 2. Cases in which the arterial spasm is a result of blood-poisoning.

In the first class are included all cases of epilepsy which are due to emotional influence, sudden terror, or anger, or long-continued anxiety and sorrow, perpetuated and intensified often by nocturnal dreams, and frequently recurring nightmare; also cases associated with those disordered states of the nervous system which are the result of vicious sensual habits; cases, too, in which the disease is hereditary. This class also includes cases of epileptic convulsions from the irritation of the gums during dentition; of the kidney, or the ureter, or the gall-duct by a calculus; and of the alimentary canal by worms. Again, the cases in which convulsions result from tumors or other organic disease of the brain are included under the head of epilepsy from a reflex influence. The structural change in the brain is not the proximate cause of the epilepsy; it excites the epileptic convulsions through a secondary reflex influence upon the bloodvessels. Dr. Brown-Séquard's guinea-pigs, rendered epileptic by injury to the spinal cord, are also included in this class of cases. The injury to the cord probably acts by increasing the reflex excitability of the nervous centres, so that a trifling external irritation suffices to excite a fit.

In the class of toxæmic epilepsy are included those cases in which noxious materials in the blood are the immediate exciting cause of the arterial spasm—uræmic convulsions and all cases of convulsions from retained excreta; convulsions resulting from the admission into the circulating blood of unwholesome and undigested food; the convulsions which result from alcoholism; the convulsions which sometimes occur during the initiatory stage of certain of the acute febrile exanthemata, more especially small-pox; the convulsions which are occasionally associated with pyæmic infection; and the convulsions resulting from a poisonous dose of prussic acid. In each and all of these cases it is probable that the immediate cause of the convulsion is anæmia of the brain, resulting from contraction of the cerebral arteries, the arterial spasm being excited by the presence of morbid blood in the vessels.

In the hypertrophy of the muscular walls of the arteries of the pia mater, which we have recently observed in cases of Bright's disease, we have evidence of a continual resistance to the passage of the deteriorated blood through these vessels. This resistance probably explains some of the cerebral symptoms of Bright's disease, but a convulsive seizure must be due to a sudden temporary increase of arterial contraction—this sudden contraction differing as much from the continuous tonic contraction of the vessels as the cardiac spasm of angina pectoris differs from the regular strong contractions of a hypertrophied ventricle. With reference to the action of prussic acid upon the bloodvessels, it is noteworthy that Blake, having killed a dog by injecting prussic acid into the jugular vein, observed that, after the animal had ceased to struggle, the dynamometer in the femoral artery still indicated a considerable increase of pressure. This fact is explicable only on the supposition that the prussic acid excited unusual contractions in the minute systemic arteries; and this contraction of the cerebral arteries would account for the convulsions in cases of prussic acid poisoning. Again, the symptoms which result from an over-medicinal dose of prussic acid are such as might be occasioned by a less degree of obstruction to the cerebral circulation. These symptoms, as described by Pereira, are the following: "Disordered and laborious respiration (sometimes quick, at others slow and deep), pain in the head, giddiness, obscured vision, and sleepiness. In some instances faintness is experienced." These symptoms are remarkably like those of the epileptic

vertigo, or *petit mal*, as it is called, and, like them, they are probably due to a temporary and partial interruption of the cerebral circulation by arterial spasm. The poison, being very volatile, is quickly exhaled by the lungs, and the symptoms soon cease. In accordance, then, with this theory of arterial contraction, epilepsy might be designated *cerebral collapse;* and, on the other hand, the arrest of the circulation by the contraction of the pulmonary arteries in the collapse of cholera may be looked upon as a form of *pulmonary epilepsy*. Without doubt, the true key to the pathology of both these awful diseases—epilepsy and cholera—is to be found in this doctrine of arterial spasm.

The two classes of epileptic cases—the purely nervous and the toxæmic—have their analogues in the two varieties of laryngeal spasm. Spasm of the larynx may result from irritation of the brain, or of the gums, or of the alimentary canal; in short, it may be a purely nervous reflex *laryngismus stridulus*, which is closely allied to epilepsy. On the other hand, laryngeal spasm may be excited by a crumb of bread or a grain of salt, or other irritant, within the larynx; and this is analogous to the arterial spasm which is excited by toxæmia, and which may result in an epileptic fit.

There are various forms of what may be called partial epilepsy: sudden and transient impairment of motor power, or irregular spasmodic movements limited to a particular set of muscles; various disordered sensations in limited portions of the skin; derangements of the special senses; sudden perversion of taste, or smell, or sight, or hearing; sudden impairment of speech; vertigo; confusion of thought; temporary delirium; and mental excitement. One or more of these symptoms may occur singly or variously combined in different cases, the onset and the departure being often equally sudden. In explanation of these phenomena, Dr. Hughlings Jackson has, with much ingenuity, suggested that they may result from a sudden temporary interruption of the blood-current through one or more branches of the cerebral arteries by spasm of their muscular walls; so that the brain-tissue, within a circumscribed "arterial region," having its nutritive supply arrested or limited, would suffer a suspension or impairment of its proper functions. This appears to be a very probable explanation of the curious phenomena in question. It must be borne in mind, that the brain is not one organ, having a simple function, like a lung or a kidney; but that it is a congeries of complex organs, having very diverse functions. It seems probable that the physiological co-operation of all these cerebral organs may require that the blood-supply to the various regions of the brain should be specially regulated by certain branches of the arterial tree, under the guidance of the vaso-motor nerves; and this regulating power residing in the arteries properly renders them liable to disorderly action under the disturbing influences of disease.

It is not now my intention to enter into details as to the treatment of epilepsy; but there are two remedies upon which I desire to say a few words, namely, chloroform and bromide of potassium. It is a well-known fact that chloroform inhalation has a remarkable power of arresting epileptic convulsions. Its action in warding off a threatened fit, and in cutting short a violent and prolonged paroxysm, is uniform and certain; as uniform and as certain as the influence of sudden and extreme anæmia in exciting convulsions. I for a time supposed that the chloroform acts by relaxing the cerebral arteries; Kussmaul and Tenner have shown that animals, when etherized, get no convulsions while being rapidly bled to death, or when their arteries are ligatured. It is probable, therefore, that anæsthetic vapors prevent or stop convulsions by lessening the reflex excitability of the nervous system, so that convulsions do not occur in etherized rabbits, even though the brain be rendered extremely anæmic by hæmorrhage or by arterial obstruction.

Recent experience has amply proved that the bromide of potassium, in full and frequent doses and sufficiently long continued, is of great value in the treatment of epilepsy. The known physiological action of this medicine renders it probable that its curative effect in

epilepsy is a result of its soothing, sedative, anæsthetic influence upon the nervous centres, whose reflex excitability it lessens. In short, its action in preventing convulsions is analogous to that of chloroform, differing in being less powerful and rapid in its operation, yet, by frequent repetition, its influence may be rendered more durable and more permanently beneficial.

On the treatment of epilepsy, Dr. Samuel Wilks, Physician to Guy's Hospital, says:

As regards the treatment of epilepsy, it must be considered entirely empirical. The term rational can scarcely be introduced even in the minor questions of diet, air, etc. I have certainly known patients reduce their amount of food and drink, especially in the article of meat, and with a corresponding diminution in the number and severity of fits; but, on the other hand, I know other cases where a generous diet has been equally necessitated. It is just one of those cases where particular drugs may be of service, and beyond their administration we can do little. If any old woman had the possession of an herb or a salt which could antagonize the disease, her knowledge would be worth more than that of the whole College of Physicians. I am happy to say that this does not apply to many other diseases, where the knowledge you have acquired of their nature will serve you far more than all the medicines in the Pharmacopœia. The remedies, then, are empirical; those that have hitherto been most in vogue have been the metallic tonics. It is remarkable that such class of drugs seems to have more efficiency in morbid states of the nervous system than those which have a more direct physiological effect. In the whole range of nervous affections you will find this to be the case. In my own experience, the only remedies of this kind which I have seen useful have been belladonna and nux vomica—drugs having different physiological actions. I have had cases where both remedies have been apparently beneficial. The metals have been used with a certain amount of success from time immemorial, such as arsenic, silver, iron, and zinc. Some years ago I used all these remedies largely amongst the out-patients, and should certainly give the preference to zinc; I know now more than one case of epilepsy where the patient is always better on the resumption of this remedy. If you suspect any local cause in the brain, you may adopt other measures; thus I have seen a case apparently cured by mercury. Those which were benefited by iodide of potassium had no doubt a syphilitic origin.

It was whilst I was examining the effects of the various remedies that I discovered the very superior value of the bromide of potassium. I was at that time trying this remedy against the iodide in bronchocele and some other disorders, and being in the habit of often using the iodide in epilepsy, I substituted the bromide for it. I was at first under the impression that it was acting as an absorbent, and was picking out for its operation those cases where the disease had a syphilitic or local origin; but when the cures came to be numerous, the explanation would not apply, and it was evident that a very valuable specific remedy had been obtained. Various writers had certainly mentioned the drug with a host of others, but only to again lay it on the shelf with them. I was not aware at that time that Sir C. Locock had recommended its use, for it does not appear that his observations had been specially brought before the profession, much less been confirmed by others. As far as I know, it was when Sir C. Locock was President of the Royal Medical and Chirurgical Society, on the occasion of Dr. Sieveking reading a paper on epilepsy, that he made the following remarks, and which I quote from the *Lancet* of May, 1857: "Some years since he had read in the *British and Foreign Medical Review* an account of some experiments performed by a German on himself with bromide

of potassium. The experimenter had found that when he took ten grains of the preparation three times a day for fourteen days, it produced temporary impotency, the virile powers returning after leaving off the medicine. He (Dr. Locock) determined to try this remedy in cases of hysteria in young women unaccompanied by epilepsy. He had found it, in doses of from five to ten grains three times a day, of the greatest service. In a case of hysterical epilepsy, which had occurred every month for nine years, and had resisted every kind of treatment, he had administered the bromide of potassium. He commenced this treatment about fourteen months since. For three months he gave ten grains of the potassium three times a day. He then reduced the amount, and the patient had no epilepsy since the commencement of the potassium. Out of fourteen or fifteen cases treated by this medicine, only one-half had failed." It was in the early part of 1860 that I commenced to use it; in the following year about a dozen cases were published in the *Medical Times and Gazette*, being the first series of cases systematically described (that I can find) in which the remedy had been found eminently successful. It was thus evident that the bromide was not simply supplanting the iodide in the cure of some special form of the complaint, but that the drug had some remarkable influence over the pure and simple form of epilepsy. This has now been confirmed by others, and even by those who had previously merely administered the bromide, as they had done many other remedies, without sufficient trial, and had discarded it. Of course, like every other remedy, its success has been overrated, and thus the disappointment which naturally accompanied the reaction of opinion, more especially when it was employed for almost every disease in the nosology. As regards drugs, then, I should say that zinc and the bromide are the most important; but you will have no lack of opportunity of trying the effects of remedies, for epileptics often insist on being physicked year after year when absolutely nothing is being done for them.

I ought to mention the occasional value of counter-irritants to the back of the neck, and of setons. I well remember two men who some years ago attended at the hospital, and whilst the seton was open the fits were absent; when this dried up they returned. I have seen other cases of the kind since this time. I have already mentioned the case of a man whose life was saved by bleeding. I do not know that it is a remedy against the disease, but that it acts in the most beneficial manner if the paroxysm is long continued I have no doubt. In the case I referred to, the man had had a succession of fits for some hours, had swallowed nothing, and must shortly have died from congestion of the lungs, had not the lancet relieved his circulation and almost immediately restored him to consciousness. I think it very probable that in those cases in former times which were considered apoplectic, and in which recovery rapidly took place after bleeding, epilepsy was the real disease. I am convinced that I have seen several such, and therefore think they cannot be uncommon. A man, for example, is seized with a fit; you are called to him, and find him comatose, with stertor and apparent paralysis of one side; you consider it to be a case of apoplexy, and recommend bleeding; he soon afterwards recovers his consciousness, and after a few hours the weakness of the limb has passed, and the patient is comparatively well. Whatever the diagnosis, the remedy has succeeded, and thus, in a severe fit of epilepsy which becomes protracted, I have no hesitation at all in recommending you to open a vein. It might appear strange, after declaring that an epileptiform fit may be induced by loss of blood, immediately to recommend venesection as a remedy, but it does not follow that the theory and the treatment are antagonistic, for whatever may be the immediate cause of the seizure the result is a spasm of the chest, which, ending in congestion of the lungs, is best relieved by liberating the blood from the overcharged venous system.

I ought not to forget to mention the remarkable circumstance of our capability of arrest-

ing the attack by acting on the spot whence the aura proceeds. If the attacks were due to an irritation reflected from one spot, then the removal of this cause would stop the fit, as in the case of the child I mentioned, whose father assured me that the application of laudanum to a sore spot on the face would arrest or mitigate the paroxysm. But when the sensation on the surface is altogether subjective, a great difficulty in the explanation arises; unless we are content with supposing that as one portion of the brain must be more especially involved in order for the sensation to be felt in one part of the body rather than another, so some external application to that part may cause a corresponding reflection backwards, and arrest the process that had already commenced.

Dr. Walter Tyrell, in treating epilepsy by strychnia, gives a case as follows:

A. C., aged eighteen, a girl of dull complexion and low nervous temperament, has suffered from epileptic attacks from eight years of age, but much more severely since the appearance of the catamenia, which have been irregular. During the past two years the attacks have recurred every four or five days and oftener at the menstrual period. They are violently convulsive, but are not preceded by any aura or other warning. Her memory is much impaired, and she suffers from almost continual headache. I here commenced with $\frac{1}{12}$th grain of strychnia, and it was only necessary to increase it to $\frac{1}{10}$th, as the good effects were at once perceptible in an improved state of health, regularity of the uterine functions, and an entire cessation of the fits; in fact, only two, and those at intervals of fourteen days, have occurred since she first commenced the medicine, and she has now been perfectly free for five months. In this case also, cold bathing, walking exercise, and early rising were made adjuncts to the treatment. Both in this and the following case the reason of the rapid success of a comparatively small dose is that the predisposing cause of the attacks was but slight, and that consequently an increase of nervous power being supplied to the medulla oblongata enabled it not only to restrain the irregular discharge of nervous power, but also to restore the healthy functions of the uterus.

A. B., aged twenty-three, a dull, phlegmatic looking girl, with low, retreating forehead, has been the subject of epileptic attacks for eight years; but latterly they have become much more severe in all their characteristics. The catamenia have never been regular. In this case I commenced with $\frac{1}{10}$th of a grain of strychnia, which dose she continued to take for nearly two months, when it was increased to $\frac{1}{8}$th. Under this (in combination with cold affusion and outdoor exercise) her health rapidly improved, and the attacks to which she was subject about every ten days, decreased both in number and severity. She has now been entirely free from attack for more than four months, and has discontinued the medicine for nearly half of that time.

I have now been watching the effects of strychnia upon various forms of epilepsy since 1861, and I have no hesitation in affirming, that in a large majority of cases its effect is most beneficial; at the same time, I would not be at all understood to vaunt it as specific, *per se*, in all cases. I think that its value lies in the effect it has in deadening that condition of "exalted sensibility" and activity of the medulla oblongata which Van der Kolk (and, I imagine, most recent authors) considers the predisposing cause of the disease. That this is the effect of strychnia is, I think, proved by cases narrated in my former papers, but especially by the case which I mentioned in my last paper, a few points of which I will recapitulate, as it affords a capital illustration of my meaning: A gentleman, aged forty, had suffered for sixteen years from violent convulsive epilepsy. The attacks varied from fifty to sixty in the month, and occurred chiefly at night. His mental faculties were little if at all impaired, and his general health perfectly good. No excit-

ing cause could be discovered, and he had used every variety of means without benefit. The only fact which had any bearing on the case was that, previous to the commencement of the attacks, he had been subject to frequent and severe epistaxis, on the stoppage of which the attacks apparently came on. Now, here was a case which would undoubtedly belong to that group which Dr. Reynolds, in his valuable work on epilepsy, has classed as most intractable and least amenable to treatment. Yet from the first day of this patient's commencing strychnia the attacks diminished, both in number and severity, in the most remarkable manner, so that in the first month of treatment the attacks were only eleven in number against fifty-one in the previous month, and this without any increase of severity. Nor has this result been merely a temporary one; but the patient, who is still under treatment, has gone on progressing, and I heard from him only a few days since, to say that he had had an interval of eleven days without any attack. I single out this case, as it was one of unusual severity, was due to no special exciting cause, and belonged to a class of cases which are generally admitted to be very intractable, yet it yielded at once to the plan of treatment I mention. This might be called a case of pure epilepsy, for the disease was due to no exciting cause, and this would probably account for the strychnia alone being sufficient to produce such favorable results. In most cases, where various exciting causes are at work keeping up the sensibility of the medulla oblongata, it is necessary to remove them at the same time that we are restoring the healthy condition of the nervous centre by strychnia. The stomach, uterus, pharynx, kidney—in fact, almost any organ—may be the seat of these exciting causes; and I think that, in the treatment of epilepsy, the grouping of the cases according to the nature and locality of their exciting causes, offers the best prospect of success. Thus, I would in all cases give strychnia to remedy the predisposing cause, and at the same time endeavor to discover and treat the exciting cause or causes. In a large class of cases, the exciting causes of irritation will be found to lie in the gastric branches of the pneumogastric nerve, and it is in these cases that nitrate of silver, sulphate of zinc and copper are so useful, and they act, I believe, by deadening the sensibility of the nerves of that part. In irritation proceeding from the uterus and sexual organs the bromide of potassium is very useful, coupled often with aloes and other emmenagogues. In many cases, where I have found the disease coupled with irregular pulse and signs of cardiac derangement, I have found digitalis to act well. With regard to diet, I find that almost all cases of epilepsy bear a liberal diet, with a fair amount of stimulant, and I have often seen marked improvement follow a change from a spare to a full diet; of course, attention must always be paid to the prevention of anything like a heavy meal, more especially in those cases in which gastric irritation would appear to be the exciting cause. I have, since writing my last paper, seen several cases of *petit mal* in children, and in all of which I have found strychnia successful; and I may here mention, that I think some distinction may be drawn between these attacks when they occur prior to puberty, and when they are present in adults. I think that in childhood they are less destructive in their effects upon the mind, and they certainly yield much more readily to treatment.

J. K., eleven, a not unhealthy-looking boy, has been subject for five years to attacks of *petit mal*, with occasional severe fits of convulsive epilepsy, the latter having usually come on after an excess in eating, though twice they have occurred at night. He had convulsions in infancy. In the slighter attacks he would lose himself for a few moments, would stop talking, or would talk incoherently in the middle of some sentence, would occasionally turn his head over his right shoulder, and in some cases his countenance would become livid. His memory was not affected, and he was very fond of poetry and of books generally. I commenced to treat him in July last, enjoining great care in diet, that it should be liberal, plain, but never in great quantity at once. I gave

him $\frac{1}{16}$th of a grain of strychnia in solution twice daily; the attacks yielded almost at once, and he has now been perfectly well for nearly six months. The attacks of *petit mal* were here very frequent; sometimes as many as three and four would occur in one day.

The above cases are merely selections from a number, and are chosen as presenting features very commonly met with—a plan which I consider more likely to be useful than the narration of cases which present symptoms but rarely met with. I may say that, in all the cases in which I have used strychnia, I can find but three cases in which it has not produced any favorable result; and, on the other hand, I have seen no case in which it has produced an unfavorable effect. With regard to the doses, in severe cases I am in favor of giving a medium quantity for a lengthened period, rather than carrying the dose very high at first. In one case, narrated in a previous paper, the dose taken reached as high as $\frac{1}{5}$th of a grain, twice daily, and this was continued for some three weeks without any bad effects being perceptible. But I find that quite as good results are obtained by a long continuance of a medium quantity, say from $\frac{1}{10}$th to $\frac{1}{8}$th of a grain, the system appearing to regain its nervous strength under the continued use of the medicine.

On the treatment of epilepsy by belladonna, Dr. J. S. Ramskill, Assistant Physician to the London Hospital and Physician to the Hospital for Epilepsy and Paralysis, says:

Concerning the treatment by, and action of, belladonna in epilepsy, I will give you, in a short compass, the results of my experience in its use. First, you must not always, nor even usually, look for immediate and palpable beneficial results. The number of fits at first may not lessen in equal times; very frequently, the reverse obtains; and you may expect, for three or four weeks after commencing it, even in the most appropriate cases, a complaint that the patient gets worse; but after six or eight weeks, if any amelioration occur, it will be decided and progressive. At first the dose should be very small, and gradually augmented until the pupil shows signs of its action, and the patient complains of both alteration in sight and dryness of throat. Having obtained this result, and maintained it for some weeks, the dose may be gradually diminished; but its effects on eye and throat are not to be so diminished as to become imperceptible to the patient, but only so far lessened as to cease causing absolute discomfort. The other toxic effects of belladonna are wholly uncalled for. Patients vary greatly, both as to susceptibility in the action of the drug, and in other respects. The annoyance as to dry throat and disturbed vision, which, at the expiration of a month, may be said to be unendurable, will now and then cease, the dose being the same, or even slightly increased; but I may remark, these cases always improve most rapidly. I prefer to give the drug in an eighth of a grain dose three times, or only twice, daily, for a week; then a quarter of a grain for fourteen days; a third for the next fourteen days, at which time its physiological action will in most cases be manifest. I think it wise to halt at this dose for two or three months, slightly increasing the dose if the patient shows diminished susceptibility to its influence, decreasing it if the reverse happens, and then gradually dropping it to the quantity first administered. I have given as much as four grains for a dose, but very rarely. I think it imperative to say, that I have never been able to give in epilepsy the large doses which Dr. Fuller has succeeded in administering in other diseases of a convulsive character. In this remark I am supported by the authority of my colleague, Dr. Brown-Séquard, who has arrived at the same conclusion. One objection to the use of belladonna, when you cannot see your patient at regular intervals, arises from its uncer-

tainty of strength and corresponding difference of action. To those who wish to use a preparation of uniform strength, having similar, and, in some cases, improved properties of belladonna, the salts of atropia are now easily procurable. The best of these is the valerianate of atropia; the commencing dose a hundred-and-twentieth of a grain. Hitherto, I have preferred belladonna, having had a strong desire to find what it could, and if possible, what it could not accomplish in the treatment of epilepsy. It is right to say there are different methods of administering belladonna. Trousseau gives a centigramme of the extract and an equal quantity of the powder of belladonna for the first month, in the evening of each day. He gives it at this time because of the frequent nocturnal character of epilepsy, and partly because of the disagreeable effect on the sight and throat during its early administration. During the second month he gives two such pills at the same time, and during the third month three pills. If, at the end of six or nine months, the frequency of the fits is decreased, he increases the dose. He asserts that, of 120 patients, he has cured twenty. A most important question now arises,—Do we know anything of the nature of the action of belladonna beyond the empirical results obtained in treatment? If a drop of solution of belladonna or atropine be dropped on the foot of a frog properly prepared, and fixed on the field of a microscope, the bloodvessels will be seen to contract, and they will remain in this condition for a considerable time. For comparing the action of opium, a solution of the latter, similarly prepared, was applied to another part, and the vessels were immediately dilated. Now, belladonna, internally administered in medicinal doses, causes, first, dilatation of the pupil, with dimness of vision; secondly, dryness of throat and difficulty of swallowing; thirdly, increased tone of involuntary muscle; fourthly, it relaxes the bowels, and cures incontinence of urine, arising from weak sphincter vesicæ. As dilatation of pupil is one of the earliest phenomena, let us see if we can account for it. There are two sets of fibres in the iris. It is well known that the sympathetic is the motor nerve of the external longitudinal fibres of the iris, which radiate from the centre to the circumference. The branch of nerves supplying these fibres comes from the cervical ganglia of the sympathetic. Excitation of this nerve, from any cause, will cause a contraction of these longitudinal fibres, and a corresponding dilatation of pupil. There is also a circular set of fibres immediately surrounding the margin of the pupil. This set is under cerebral control; that is to say, its motor supply comes from a branch of the third nerve. Any irritation in the brain or along the trunk of the nerve, or an excitation by light on the retina acting in a reflex manner, will stimulate this branch of the third to action, and cause contraction of pupil.

But we may have dilatation of pupil without increased action of the sympathetic; it may be acting normally, then the third nerve must be supposed deficient in power. This is a common result observed in compression of brain. On the other hand, contraction of pupil may be present without abnormal activity of the third being necessarily supposed. This condition is invariably produced by section of the sympathetic in the neck. Dilatation of pupil may, in short, depend upon the action of the sympathetic being in excess, or in diminished power of the cerebral nerve. In epilepsy it is easy to observe, from collateral symptoms and the general condition of the patient, that dilated pupil, when it exists, which is much rarer than a normal condition, is usually caused by an active sympathetic overpowering the third nerve. The same dilatation may be observed in most convalescents after acute disease, and in most affections involving extreme debility; but here it would be more correct to say that the dilatation was rather the effect of a compressed condition of the third cerebral nerve accompanying a normal sympathetic than of an active sympathetic accompanying a normal condition of the cerebral nerve. I have said the branches of the sympathetic nerve which go to the iris come from the cervical sympathetic. Dr. A. Waller, with Professor Budge, have made experiments which seem

to prove that the nerve-fibres of the cervical sympathetic, which go to the iris, originate from the spinal cord, between the sixth cervical and the fourth dorsal vertebræ. Dr. Brown-Séquard has ascertained that the origin of the fibres of the sympathetic going to the iris are still more extended. I have mentioned that division of the cervical sympathetic allows the uncontrolled third cerebral nerve to contract the iris. Dr. Brown-Séquard has shown that a section of the spinal cord, as high as the level of the fifth cervical or as low as the ninth or tenth dorsal vertebræ, affects the iris in the same manner but in a less degree than section of the sympathetic. On the other hand, Schiff has shown that some of the fibres animating the iris ascend the cervical part of the spinal cord, and most probably go up to the medulla. I may also say here that the sympathetic is the motor nerve of the bloodvessels, supplying various parts of the head. It is especially interesting to know the origin of these vaso-motor nerves, especially in relation to loss of consciousness, the initial movement of a fit of epilepsy, and also in regard to the pathology of the *petit mal*, as well as the great light such knowledge would throw on the action of belladonna in epilepsy. Dr. Brown-Séquard discovered, some years ago, that the motor nerves of the bloodvessels going to various parts of the head come out chiefly from the spinal cord by the roots of the last cervical and first and second dorsal nerves. He thinks, however, their real place of origin to be partly the spinal cord, partly the higher portions of the encephalon, but chiefly the medulla oblongata and the neighboring parts of the encephalon. In the case of R. P., it will be remembered the ferrum candens was applied to each side of the spine, opposite the last cervical and first dorsal vertebræ. The reason will now be apparent. The vaso-motor nerve fibres are able to contract the bloodvessels directly, when excited. We hope, by frequently cauterizing the tissues opposite the seat of exit of these nerves from the spine, to effect some change in the nutrition of the parts to which these nerves are distributed. We can now understand the nature of the action of belladonna in producing dilatation of the pupil, and, from its effect on the iris, we can deduce a strong probability of the nature of its action in epilepsy. It is a stimulant to the sympathetic, the motor nerve of the bloodvessels, and it is only on this supposition we can account for the other physiological effects of the drug.

I would add, although experience shows belladonna is one of the most powerful contractors of the bloodvessels of the spinal cord and its membranes, it has a comparatively feeble action on those of the brain. I speak of its administration in medicine, not in poisonous or fatal doses. Hence arises its extraordinary adaptability in epilepsy, where we have dilatations of vessels or turgescence in the medulla and its neighborhood; of its still more marked efficacy in inflammation and congestion of the spinal cord and its membranes, as well as of its comparative inutility (administered alone) in those cases of morbid activity of brain, connected, as we think, with more or less congestion of gray matter, in some forms of incipient insanity, associated with sleeplessness and suicidal tendency, as well as in some other cerebral diseases.

CHAPTER XXII.

HYSTERO-EPILEPSY.

It has been claimed by some neurologists that the term hystero-epilepsy was a misnomer, that the disease in question was really hysteria major, as differing from the hysteria minor of every day practice. Prof. Charcot himself, we think, takes this view, that what at first glance is evidently epileptic is epileptic only in outer form. The case which forms the text for this chapter has proved to me, however, that there *is* epilepsy present in certain grave cases of hystero-epilepsy, and that there is also organic lesion of the brain connected with it, sclerosis, as in old cases of uncomplicated epilepsy. My case had been apparently cured by central galvanization, followed by general faradization, nerve tonics, full feeding and rest; the convulsions had ceased, although the patient did not remain under treatment as long as we desired, when after a lapse of some months the disease reappeared, and the patient finally died at home. The lesions found on autopsy were those which I correctly predicted would have been found if the case had gone on to a fatal termination instead of making, as I trusted she had, a recovery while in New York.

The history of this very interesting case is as follows:

During the latter part of April, 1880, I was called in consultation by my friend Dr. J. Marion Sims, to see a case of hystero-epilepsy. I found a lady of twenty years of age, who was suffering from cerebral and spinal anæmia; who was having terrific convulsions day and night, which were aggravated, both in duration and intensity, by anything that disturbed her very excitable nervous system. Her history, as given by the mother, was as follows: During childhood she had very severe convulsions with every infantile disease, and also whenever she was in an anæmic condition. This points decidedly to epilepsy. These convulsions from infancy, presented an epileptiform type. When she was ten and a half years old menstruation appeared; and at the menstrual periods thereafter, until she was fourteen years old, the convulsions were of the severest type, exhausting her very much. Another unfavorable symptom, for periodical neuroses are notably intractable to treatment. She was treated by nearly all the physicians of eminence, both at home and abroad, but with very little success. While abroad, occupied with sight-seeing

and taking a great deal of exercise in Switzerland, she had almost absolute freedom from the convulsions, although she was very thin. This is still another fact confirmatory of the existence of true epilepsy, as my experience has taught me in treating epilepsy that my patients who took long walks out of doors, suffered the least from the epileptic seizures.

Sir Thomas Watson gave it as his opinion that the convulsions would disappear of themselves as she grew older, and gave the diagnosis of hystero-epilepsy. He suggested no treatment. The mother and daughter returned home, and on their arrival in America the convulsions reappeared with renewed intensity. The patient would sometimes have forty convulsions in the twenty-four hours. The mother applied to Dr. W. A. Hammond, and he sent her to Dr. Sims for his opinion relative to the propriety of performing Battey's operation of oöphorectomy, hoping that this would give relief. There was a distinct epileptic aura at this time, starting from the uterus and radiating towards each ovary, where it sometimes stopped, but, if it reached the epigastrium it always resulted in a terrific convulsion. Pressure on the uterus and ovaries by conjoined manipulation caused the sensation of the aura, but failed to produce or check actual convulsions. She never, I think, absolutely lost consciousness during the seizures. As no treatment had heretofore given any relief, Battey's operation was determined upon and was performed by Dr. Sims, January 11th, 1880. The ovaries were found to be diseased, having undergone cystic degeneration. The patient soon recovered from the effects of the operation, but her convulsions were not controlled by it. I think, however, that by this operation Dr. Sims laid the corner-stone of the improvement which I afterwards obtained, as I do not believe that with diseased ovaries I could have been as successful as I was.

It was decided that the patient should be placed under my care, and I accordingly took charge of her May 22d, 1880, at my private hospital for nervous diseases. At this time she had, as I have said, terrific convulsions night and day, the element of epilepsy predominating. There was no epileptic cry, properly speaking, but she would call out "Mamma!" and become very pale; there would be a twisting and squinting of the eyes and terrible convulsive movements of the legs and arms, strongly impressing one with their close alliance with the most aggravated movements in the worst cases of chorea. She would come out of a severe convulsion instantly, with panting breath, as if she had just come in from an excessively long walk. In a few

seconds she would feel comfortable again. The thumbs were not folded into the palms of the hands. It was decidedly the most unique exhibition I have ever witnessed in the whole course of my practice. She differed entirely from most patients with hysteria, in that she suffered mentally very much, fearing in her own mind that she had true epilepsy, and at times would grow quite morbid about it. At such times I tried to raise her spirits by telling her that she would certainly recover in time, and she then would become more cheerful and make every effort to fight off the convulsions. I questioned the mother closely about hereditary predisposition, but she denied any hereditary taint of nervous disease, or anything else that could even remotely have influenced the child unfavorably. I questioned her, also, very closely about her own mental condition while pregnant, as it is my firm belief that the future life of an unborn babe is strongly affected by the mental state of the mother during gestation; but she could recollect no disturbing circumstances, even of a trivial character. The mother was a woman of more than ordinary mind and of a remarkably equable disposition. I came, therefore, to the conclusion that the pathology of the case I had to deal with, was that of an unstable nerve element; and that the seat of the disease was in the nerve centres, with, very probably, the principal irritation in the cortical motor zone of the central nervous region. There was marked anæmia of the nervous centres. Upon what pathological process in the brain the convulsions in her infancy depended, it is hard to tell, although I presume it would be fair to consider it a lesion of irritation of the cortical motor zone of the cerebrum from innutrition, depending upon anæmia of the brain and cord.

When she was about ten years old there was gastric disturbance, and for three years she ate scarcely anything at all. Primarily, I had nerve cells to feed in order to restore the integrity of the nervous system, and I accordingly fed her with milk very plentifully, and gave her phosphorus and the animal fats in abundance. I made her rest nearly all the time at first, until her muscular strength returned, when I had her take a very moderate amount of exercise daily. I gave her, to quiet the neuralgic pelvic regions, which distressed her very much, hypodermic injections of atropia $\frac{1}{60}$ grain each, with almost instantaneous relief every time. I administered the galvanic current daily for half an hour in the form of central galvanization, the negative pole being placed on the pit of the stomach, and the positive over the top of the head, the cervical sympathetic, and on each side of the seventh cervical vertebra, using a moderately strong

current which could not be disagreeable to the patient. I considered this indicated to improve the nutrition of the deeper tissues of the nervous system, and to combat the spinal anæmia and irritation which existed. I also gave her iron and nux vomica. As she slept very badly, waking perhaps twenty times in the night with convulsions, I gave her a night mixture of sodium bromide, 60 grains, and tincture of cannabis indica, 30 minims, with a warm bath three times a week at night. I soon began to see a marked improvement. The combination of sodium and cannabis indica enabled the patient to sleep, whereas, previously she had lain awake nervously waiting for the return of the next convulsion. Making her sleep without disturbing her digestion was a great point gained. Duquesnel's aconitia was given once a day in doses of $\frac{1}{120}$ of a grain, and after about two weeks of its administration I gave hypodermic injections of Fowler's solution until the physiological effects of arsenic appeared, when I stopped it. I diluted the Fowler's solution one-half with water to prevent the formation of abscess, commencing with 3 minims and running up to 20 minims (or 40 in all including the water). I did this because the nature of the convulsions suggested chorea, and I determined to combat any such influence in the central nervous system.

It must be remembered that almost from infancy my patient had been taking some drug or other, until she had taken almost everything. She had never taken aconitia, atropia, arsenic, or the sodium and cannabis indica mixture before; neither had she ever had electricity properly applied. I had also to treat an inflammation of the cervix uteri, which I did by making a cup of absorbent cotton wrung out of warm water and filled with glycerole of bismuth, which, for three weeks, I applied every day, at last completely curing that source of irritation to the nervous system. The patient began to gain in health and appearance, and evinced a desire to eat heartily and take exercise, and a flush of healthy color began to show in her lips and cheeks. The convulsions steadily diminished in frequency and also in intensity. I now substituted general faradization for central galvanization, and the improvement still continued. In this connection I would say that I am sure, from the results of several cases of epilepsy that I have treated by the induced current and strychnia, that the induced or faradic current possesses a special power for good over the nervous system in such cases. The convulsions at the end of two months had completely left her during the daytime. I had now dropped the arsenic and aconitia, still adhering to electricity, the sodium bromide and cannabis indica at night, and the warm

baths, together with phosphorus and cod-liver oil after each meal. She was now having perhaps seven or eight seizures at night, but slept soundly between them. These grew less in frequency and intensity, and at the expiration of three months I sent her home to the West altogether a very different looking girl from what she was in May. She had gained some twenty pounds of flesh, and felt very well. There was still remaining some convulsive twitching of the muscles at night, but nothing like a true convulsion as before. The patient was obliged, for family reasons, to return to the West at the beginning of September, although she ought to have remained under treatment until at least six months had elapsed; and had she done so, the gratifying results which I had obtained might have been made permanent. The cod-liver oil, which she took in teaspoonful doses, was of immense benefit to her, as it always is, in my experience, in the class of hereditary diseases to which epilepsy belongs, as it seems to exert a special prophylactic effect.

Respecting the cerebral localization in this case, my opinion was expressed as follows before the patient left for home, and the subsequent events confirmed the correctness of my opinion:

That the upper and lower limbs, the forearm, the hand, and the facial muscles were all affected by the convulsions. There was an alteration in speech—a deficiency of impulse and some difficulty in the conduction of speech—at times; in other words, partial and incomplete verbal paralysis. The brain disease evidently affected the ascending parietal convolutions, which are the cortical centres for motility—in the innermost and superior part for both upper and lower limbs; in the middle, for the forearm and head; and in the external or inferior part, for the facial muscles. The most inferior part of the ascending frontal convolution and the foot of the third frontal convolution, which are the motor centres for the muscles which affect the pronunciation of words, I considered also as undoubtedly affected, leading to the alteration and deficiency of impulse of speech. I also considered it probable that there was bilateral circulatory disorder of the cornu ammonis, which, I said, if the case had progressed for the worse, would undoubtedly have proceeded to atrophy and sclerosis. The cornu ammonis has this relation, histologically, to the motor functions, that its cellular elements consist of a cortical stratum of grand pyramidal nerve-cells, analogous to the structure of all the central motor nervous regions.

Charcot, in his *Lectures on the Diseases of the Nervous System*, speaks of a case of hystero-epilepsy, where he found bilateral

sclerosis of the cornu ammonis; and in autopsies in cases of epilepsy, Foville, Bouchet, Mynert, and Pfleger all unite in describing this lesion of sclerosis and atrophy of the cornu as of frequent occurrence. On the other hand, the physiological results in Kussmaul and Tenner's experiments on epilepsy in animals, where epileptic convulsions were artificially induced, seemed to show that ablation of the cornu ammonis had no effect on the general convulsions. We, as physicians, however, are more concerned with clinical and pathological than with physiological results, however important the latter may be. The pathology of this interesting case of hystero-epilepsy I therefore considered, when the patient left me, to have been a circulatory disorder, accompanied by great irritation of the cortical motor zone of the central nervous regions, which, if the case had progressed unfavorably—as after a lapse of some months it did—would have led to atrophy and sclerosis of the ascending parietal convolutions, the most inferior part of the ascending frontal convolution, and the foot of the third frontal convolution, and of the cornu ammonis. This was what I put on record concerning this case when she went away. The accompanying letters from her mother, and one from the physician who at last made the autopsy, show the redevelopment of convulsions, the lesion of irritation ending in atrophy and sclerosis of the cortical motor zone:

"JANUARY 25TH, 1882.

"DR. MANN:

"MY DEAR FRIEND.—Your kind letter reached me some time since and would have been answered immediately could I have obtained the information you desired. Yesterday I received a letter from Dr. Gapen, with many apologies for the delay, and the *written examination*, of which I send you a copy. He has never attended ———, and all he knows of her he has gathered from other physicians and my family when I was absent. I had indeed hoped that ——— would grow out of her troubles; and as her general health seemed at times to be almost perfect, I felt I had good reason to hope. Her brain grew more and more active,* and she was greatly changed. She read a great deal; was always busy and hopeful, most of the time very cheerful. She grew very appreciative of what was done for her, and up to the last spared me all she could from sharing her bad feelings. For more than a week before she died I was aware that there was a change in her symptoms, and hardly knew what to look forward to; but, basing my hopes upon the many things that had been told me, I looked upon any change as favorable. Last winter she was as bad, seemingly, as she was this time, with this exception, there was no visible sign of congestion of the brain, as at this time. Then, when I felt she was surely dying, she dropped into a sleep which lasted two nights and one day without awakening, —for three days she did not speak,—then she got up and dressed herself, and sat down in a little chair by the window, and, looking up at me, she said: 'Mamma, I never looked at you before with the thought of how you looked. Everything seems so different to me from what it ever did—my room—all my friends—everything.' She had not been able

* Her mind, up to the time she came to New York, had been that of a child,—undeveloped.

to lie down without feeling badly. Now she could lie or sit, and it all seemed so lovely to her. She went on improving in strength, and with everything so natural that we both felt paid for all we had done and all we had suffered. This state of things lasted for two months, and then came a return of the old symptoms. The spasms increased from one a week to one a day, and then three, and so on, to sixteen or twenty during the twenty-four hours. Sometimes she would go for a week without any exhibition of nervousness, etc.

"As ever yours, —— ——."

After death, the following appearances were found by the very able and intelligent physician who made the autopsy, and who kindly forwarded the results to me:

"*Post-mortem Examination of the Body of Miss —— Twenty-four hours after Death.*—Found atrophy of the uterus, with absence of the ovaries. Wounds made in the removal of the latter perfectly cicatrized. Evidences of severe general peritonitis, in adhesions of the intestines, both to the abdominal walls and to each other. Nothing abnormal in stomach or intestinal lining. Lungs and heart also normal. On opening the calvarium, the brain was found gorged with venous blood. Every vein and sinus was distended to its fullest capacity. There was no effusion of blood either on the surface or into the tissue of the brain. The *dura mater* was glued down to the *pia mater* over a large space, covering nearly the whole of the top of the brain, by a thick and strong effusion of lymph. These adhesions were very firm, especially along the borders of the longitudinal fissures. On the left side nothing further than this was found abnormal, but on exposing the *right* hemisphere, the eye was at once attracted by a very marked depression, extending over an irregular area of nearly two inches in diameter, and involving the *second frontal*, *ascending frontal*, and *ascending parietal* convolutions. This area was apparently depressed about $\frac{1}{32}$ inch below the surface; was flat, the interspaces between the convolutions being filled with lymph, and the pia mater translucent over the depression from the effusion of lymph into it. To the touch this part was very much firmer and denser than the rest of the brain. The borders of the hardened area were sharply defined to the touch. This indurated condition extended through the entire thickness of the gray matter and into the white matter below, being in all about half an inch in depth and continuing the same in extent and in the sharp definition of its borders. On laying back a layer of the brain deep enough to include the entire induration and including it between the fingers, the sclerosed part was so much harder than the surrounding parts as to seem like a foreign body. In the absence of microscopic investigation, which is yet unfinished, I can only add that the lesion seemed a sclerosis, which was probably the result of chronic inflammatory action. The lesion furthermore belonged to the *irritative* as opposed to the *destructive* class, as there is no evidence of any marked loss of function of this part of the brain. If, as I anticipate, the lesion proves to be irritative wholly in its character, it will be the most extensive and important of its class ever reported. When the microscopic work is finished, I will take pleasure in adding to this report such additional facts as may be thereby brought to light.

"Yours very respectfully, CLARK GAPEN."

In hystero-epilepsy the influence of nitrate of amyl in mitigating or temporarily postponing convulsions is incontestable, even although the progress of the disease may not be interfered with. Applications of ice, and especially *pressure*, should be made in the region of the ovaries, where we find almost invariably hyperæsthesia with semi-

anæsthesia on the opposite side. These appliances, if resorted to contemporaneously with the aura, prevent the fit, and if during the attack, they arrest it oftentimes. The close of the various steps and stages of hystero-epilepsy terminating in recovery may sometimes be very abrupt, even when the disease has lasted for years. These cases generally, although not always, occur in sensitive, self-willed, and parentally indulged girls, who have been subject, in early life, to convulsions. They prefer to any duties, solitude, secret reading, and reverie, taking little food and less sleep. We may have fever, incoherence, convulsive crisis, somnambulism, and catalepsy and choreic movements, all making their appearance in this disease. Perfect recovery will follow wise treatment in the cases in which the element of hysteria predominates over that of epilepsy.

CHAPTER XXIII.

Chorea (St. Vitus's Dance).

Chorea is a disease of the nervous system, of a convulsive nature, belonging principally to early life, and characterized by irregular and spasmodic movements of the voluntary muscles. These movements take place against the will of the patient, and are usually more marked on one side of the body than the other. They soon become general, however, and are increased by the patient's attempting to exercise his will or by emotional excitement. The disease generally begins very gradually, and is not noticed for some time. Chorea has a very intimate connection with acute rheumatism and cardiac disease, and many choreic patients will be found to present, upon examination, an irregular action of the heart, an anæmic murmur at the base of the heart, or evidence of endocarditis, pericarditis, or both.

Rheumatism, therefore, and more especially rheumatism complicated with pericarditis or endocarditis, may be regarded as one of the prominent causes of chorea. Among other causes that may be mentioned, sudden fright ranks foremost, while anxiety, overwork, and

ill-health are also predisposing causes. There is also more or less paralysis in chorea, which is indicated by the loss of facial expression, loss of speech, loss of the power of swallowing, dragging of the limbs, inability to hold out the limb without its falling, the readiness with which patients become tired, and the soft, flaccid state of their muscles. Some degree of paralysis is, indeed, quite a marked feature in chorea. A child affected with chorea has a dull, listless expression, avoids associating with other children, does not evince the customary interest in his games and amusements, and becomes incapable of learning his lessons correctly or recollecting with any degree of accuracy. There is an apparent mental deficiency and there is more or less emotional disturbance, excessive timidity, capriciousness, and fretfulness. The child is restless and fidgety, and ungracefulness of movement becomes very conspicuous. He does not sit still long in one place, but is constantly changing his position. He stumbles in going about, up or downstairs, cannot hold or pass dishes at the table, and generally knocks whatever he holds against something else. The choreic movements usually begin on one side; either the face or else one hand and arm are affected. These movements soon involve the whole of one side, and, after a few days or weeks, extend to the other side, involving the whole body. If the attack comes on during an attack of rheumatism, no prodromal symptoms may be seen, or if the attack is induced by a sudden emotion the onset is sudden. The convulsions are very peculiar, and affect to a greater or less extent the whole body, and are of a disorderly, not a rhythmical nature. They consist of sudden impulsive movements. They are clonic spasms, which are not stopped until sleep comes. The speech is usually thick and confused, but not lost. When the patient endeavors to answer questions the convulsive movements of his face and mouth become much worse, and he finds it very difficult to articulate. The words come out with a peculiar drawl or stammer.

The difficulty of speech may depend upon the respiratory muscles and larynx being affected as well as upon the convulsive action of the lips and tongue. As a result of the respiratory muscles being involved, the breath is often drawn through the larynx with a suddenness that produces a strange, grunting noise. The convulsive action of the muscles of the head and neck is as irregular as those of the face, so that the head is jerked from one side to the other. The convulsive movements of the upper extremity are more striking than

those of the lower. The shoulders are hitched, the arms are moved to and from the side, the forearm is pronated, supinated, and flexed, and all sorts of grotesque movements executed. It is very difficult for the patient to hold a glass or cup of liquid to the lips, and it is carried in all directions before it reaches its intended destination. The legs are affected like the arms, and as soon as the patient tries to use them their action becomes very jerky and uncontrollable. The body is twitched about very violently into odd and eccentric attitudes. In most of the cases the features, head, and neck are in continual motion. The body is doubled up and writhed around in strange contortions, and the patient's condition is very pitiable to see. The vacant, imbecile aspect of the patient increases as the disease continues, and depends very much upon the involvement of the muscles of expression. Functional or organic disease of the different organs of the body may supervene during an attack of chorea. The leapings and dancings of the religious enthusiasts, as the "jumpers" and the "convulsionnaires," should properly be classed in the category of choreic affections. The people who, in Scotland, were affected with the leaping ague and with convulsions and dancing fits also come under this head.

Prognosis.—The prognosis is, in the majority of cases, favorable. Although chorea has a long average duration, it tends toward a natural recovery. The general length of time for an attack is from four to six weeks to three or four months. In a small minority of cases the disease lasts for many years, or even a lifetime. In the few fatal cases, the convulsive paroxysms become aggravated and the spasms are incessant. The patient dies of exhaustion. In the majority of cases, recovery is thorough and complete if the patient is judiciously treated, and the child recovers his mental and physical health, although occasionally the implicated muscles remain feeble, and atrophy or contract.

Pathology.—Several hypotheses respecting the morbid anatomy and pathology of chorea have been advanced by different observers of more or less ability. One, which originated with Dr. Kirkes, and has since been supported by Dr. Hughlings Jackson, adopts the theory of embolism. Dr. Kirkes did not indicate what part of the nervous system he considered to be the seat of the disease, but said that he considered chorea to be "the result of irritation produced in the nerve-centres by fine molecular particles of fibrin, which are set free from an inflamed endocardium and washed by the blood into the

cavities of these centres." Dr. Hughlings Jackson, adopting and enlarging on the theory of Dr. Kirkes, endeavors to show that the emboli are lodged in the vessels of the nerve-tissue forming the convolutions near the corpus striatum, the blood supply of which is derived from the middle cerebral artery, and that a condition of under nutrition is induced from a diminished supply of blood.

Dr. Radcliffe accepts Dr. Hughlings Jackson's views so far as clinical evidence can be adduced, and says: "Taking chorea of one side of the body, hemichorea, as the simplest form of chorea, and putting it side by side with hemiplegia, the result of embolism, good reason is found for believing that the disorder of movement and the palsy both point to the region of the corpus striatum as the seat of mischief. If this be the seat of mischief in hemiplegia, why not in hemichorea? The muscles moved in hemichorea are those most palsied in hemiplegia. In hemichorea, as in hemiplegia, the arm, as a rule, is more affected than the leg. In right hemichorea, as in right hemiplegia, the speech is generally very much affected. Again, hemichorea is always more or less mixed up with and sometimes ends in hemiplegia; and, on the other hand, hemiplegia, from various causes, is not infrequently attended by chorea or movements of some kind or another. The fact that the face is involved in chorea, shows that the seat of the disorder must be above the spinal cord. The facts which have been instanced, point to the convolutions near the corpus striatum rather than in any part of the brain as the part affected." Dr. Broadbent also accepts the theory of embolism of the fine vessels of the sensori-motor ganglia as the principal cause of chorea. It does not seem to me that the pathological facts which have been elicited by morbid anatomy justify the theory that chorea is produced by, or is dependent on, inflammatory processes in the brain or cord. Tremor, convulsion, and spasm do not necessarily depend upon inflammation, but may depend much more readily upon *irritation*, and this irritability may, I think, exist just as well in the thalami optici, corpora quadrigemina, pons varolii, or in the medulla or spinal cord, as in the corpora striata. The appearances in the nervous system after death, of embolism as a cause of chorea, and the morbid appearance being located in the sensori-motor ganglia, are too few to support this theory successfully, and morbid appearances which are discovered do show that all parts of the nervous system may become affected in the course of chorea. The cord is very often found affected, and particularly the posterior

columns, almost enough to suggest a relationship between this disease and locomotor ataxia. Inflammation cannot be essential to chorea, for in some cases there are no traces of inflammation. Nervous shock is very often the real cause of chorea, and in these cases there would be no lesion whatever, unless it be said that the shock or violent emotion produces an asthenic or worn, irritable condition of the sensori-motor ganglia of the central nervous system.

It has been suggested that the very great comparative frequency of chorea in childhood stands in some relation with the active functional state of the sensori-motor ganglia during this stage of existence, this view perhaps explaining the rarity of this disease in infancy when these centres have not entered on active work, and also in adult life when their period of extraordinary activity has passed. The most reasonable theory regarding the production of chorea seems to the writer to be that it primarily proceeds from a morbid irritability of the nervous centres, and that in the subsequent course of the disease any or all parts of the nervous system may become involved in an inflammatory process, but not necessarily so. In many cases there is an inherited irritability of the nervous system, which is easily proved by inquiring into the family history of our patient. Dr. Radcliffe himself says, that in the more aggravated cases of chorea there is a tendency to run into one or other of the inflammatory diseases of the brain and spinal cord. The general unilateral tendency of chorea, which, so far as it goes, is acknowledged by the writer to point toward disease of the crus cerebri, corpus striatum, or cerebral hemisphere, is offset by the involvement of the muscles of the eyeballs and of the muscles supplied by the upper portions of the facial nerves, which, as a rule, are not involved in organic lesions of this part. The tendency of chorea to implicate the whole body, and the muscles of deglutition and respiration, is also adverse to this hypothesis, and, as I have said, the general resemblance in many points of the convulsive movements to those of locomotor ataxia point to a lesion in the posterior columns of the cord. The objection to this would be, however, that if the cord were affected, the disease would not manifest a unilateral tendency. Another very decided objection to the theory of embolism is the fact of the absence of the disordered movements during sleep. If embolism were present, owing to plugging up of minute cerebral arteries, the lesion would be a constant one, and if this were the cause of the convulsive movements, there could be no remission, neither could they abruptly cease, as

I have seen them do under treatment. Another objection is, that chorea is much more frequent in girls than in boys, while rheumatism, which, by inducing vegetation upon the valves of the heart, is adduced to be the cause, is most frequent in males. Again, the embolic theory entirely fails to explain those cases which are due to fright or anxiety, where the heart is perfectly sound, and in my own practice, chorea has, so far as I have been able to trace the influences that caused it, been very often due merely to nervous shocks, which had set up the chorea by virtue of the sensorial and spinal irritability induced by the shock. I conclude, therefore, that in a great many, and I am inclined to think in the majority of cases, that chorea depends merely upon irritability of the hemispheres and cord, due, in very many cases, to debility or deficiency of nutritive vigor as the predisposing cause.

The symptoms of chorea are undoubtedly connected with a morbid irritability of the cerebral convolutions, the ganglia at the base of the brain, the pons, the medulla, and the spinal cord. The disease itself is often associated with rheumatism and cardiac disease, but it depends upon hyperæmia and morbid irritability of the nervous centres, which is produced by the rheumatic condition, or by mental or reflex nervous irritability or irritation. There is a general tendency to dilatation of the smaller vessels, and these arterial dilatations are attended with exudation into the tissues immediately surrounding them, and the sclerosis, which is thus induced in the tissues surrounding the vessels, explains the wasting of the muscles, rigidity of the limbs, and permanent paralysis when it supervenes upon chorea.

Dr. Huntington, of Ohio, described, in 1872, an interesting form of hereditary chorea which has prevailed among a few families for a long time, through several generations, on the east end of Long Island. These families regard it with horror, rarely allude to it except by necessity, and then speak of it as "*that disorder.*" Dr. Pomeroy speaks of the disease as "attended generally by all the symptoms of common chorea, only in an aggravated degree, hardly ever manifesting itself until adult or middle life, and then coming on gradually but surely, increasing by degrees, and often occupying years in its development, until the hapless sufferer is but a quivering wreck of his former self. It is as common, and is indeed, I believe, *more* common, among *men* than women, while I am not aware that season or complexion has any influence in the matter. There are three marked peculiarities in this disease: 1st, its hereditary nature; 2d,

a tendency to insanity and suicide; 3d, its manifesting itself as a grave disease only in adult life.

"1st. Of its hereditary nature. When either or both of the parents have shown manifestations of the disease, and more especially when these manifestations have been of a *serious* nature, one or more of the offspring almost invariably suffer from the disease if they live to adult age. But if by chance these children go through life *without* it, the thread is broken, and the grandchildren and the great-grandchildren of the original shakers may rest assured that they are free from the disease. This, you will perceive, differs from the general laws of so-called hereditary diseases, as, for instance, in phthisis or syphilis, when *one* generation may enjoy entire immunity from their dread ravages, and yet, in another, you find them cropping out in all their hideousness. Unstable and whimsical as the disease may be in *other* respects, in *this* it is firm; it never skips a generation to again manifest itself in another; once having yielded its claims, it never regains them. In all the families, or nearly all, in which the choreic taint exists, the nervous temperament greatly preponderates; and in my grandfather's and father's experience, which, conjointly, cover a period of seventy-eight years, nervous excitement in a marked degree almost invariably attends upon every disease these people may suffer from, although they may not when in *health* be over-nervous.

"2d. The tendency to insanity, and sometimes that form of insanity which leads to suicide, is marked. I know of several instances of suicide of people suffering from this form of chorea, or who belonged to families in which the disease existed. As the disease progresses, the mind becomes more or less impaired, in many amounting to insanity; while, in others, mind and body both gradually fail until death relieves them of their sufferings.

"3. Its third peculiarity is its coming on, at least as a grave disease, only in adult life. I do not know of a single case that has shown any marked signs of chorea before the age of thirty or forty years, while those who pass the fortieth year without symptoms of the disease are seldom attacked. It begins as an ordinary chorea might begin, by the irregular and spasmodic action of certain muscles, as of the face and arms, etc. These movements gradually increase, when muscles hitherto unaffected take on the spasmodic action, until every muscle in the body becomes affected (excepting the involuntary ones), and the poor patient presents a spectacle which is anything

but pleasing to witness. I have never known a recovery, or even an amelioration of symptoms in this form of chorea; when once it begins it clings to the bitter end. No treatment seems to be of any avail." Dr. Huntingdon says that ordinary chorea is of exceedingly rare occurrence in this section, and he does not remember a single instance of its occurring in his father's practice. He suggests nothing as to its pathology. I have met with one instance of chorea minor in a father, son and grandson, but it acted very differently from the form described above. In the son and grandson it appeared in early life, and I do not see that it has ever assumed grave proportions in either, although the nervous system preponderates in all.

Treatment.—There are few diseases of the nervous system so easy to treat successfully as chorea in its ordinary form, and few in which so many remedies have been employed. Dr. Sydenham says, "Forasmuch as this disease seems to me to proceed from some humor rushing in upon the nerves, which provokes such preternatural motions, I think the curative indications are first to be directed to the lessening of those humors by bleeding and purging, and then to the strengthening the genus nervosum, in order to which I use this method: I take seven ounces of blood from the arm, more or less, according to the age of the patient," etc., etc. This old treatment has been abandoned, although Sir Thomas Watson recommends local bleeding when there is a fixed pain in the head, and he also uses iron which is the favorite medicine in cases of chorea, with English practitioners and Dr. Elliotson especially; forty cases of cure being reported by this mode of treatment.

It has appeared to me that the good accruing from the use of iron is that obtained from improving the general health of the patient, and in this way, as iron is an important tonic, it undoubtedly does good, although I do not think it should be regarded as exerting any specific action in chorea; sulphate of zinc in increasing doses, commencing with one grain three times a day has been employed. Strychnia has been employed, especially in France, where it was introduced as a remedy for chorea by Trousseau, who commenced with doses of $\frac{1}{28}$ in children, gradually increasing it until the full physiological effects of strychnia were produced, maintaining them for awhile. The iodide and bromide of potassium have also been used, but without practical results. The various narcotics have been tried, with no good results. In my own treatment of these cases I endeavor to give the nervous system rest and nutrition. I obtain the former by

avoidance of excitement, early hours, and the calmative influence of warm baths at bed-time; the latter by using phosphorated cod-liver oil, or the oil in connection with the phosphide of zinc, $\frac{1}{10}$ grain, in pill three times a day. Gentle gymnastic exercises are very valuable, and should by no means be neglected. My favorite remedy, and the one which seems to be the nearest to a specific in chorea is arsenic, which I use hypodermically in the shape of Fowler's solution. I use a mixture of equal parts of Fowler's solution and water, to avoid any local irritation which might be produced by the undiluted solution. In children I rarely see any want of toleration of the drug in the system, and rarely also, in those of older years. I have found that very rapid improvement generally takes place under this treatment from the first, and my patients gain flesh. I generally use electricity in the form specially indicated in individual cases as an important adjuvant in improving the whole nervous and physical condition of my patients. I commence with three minims of Fowler's solution and inject, subcutaneously, for a week, every other day, and in the second week increase the dose to five minims every other day, increasing two minims each week, and in a month or six weeks a cure will be obtained, while in old cases sixty or seventy days may elapse before a cure is complete. Marked improvement is always noticed from the first by this plan of treatment.

By this method the gastric disturbances which are produced when the medicine is given by the stomach are avoided, and the good results which we can obtain are very much more rapid. I advise this plan of treatment in chorea by general practitioners, believing that they will find it, as I have, most efficacious.

In 1849 there was reported in the *London Medical Gazette*, of April 27th, the second Lumleian lecture, by Dr. R. B. Todd, of England, on chorea. Many of the remarks there found are equally sound to-day. He remarks that the most common exciting cause of chorea is fright or strong mental emotion. He cites a case of one of his patients, a girl, nineteen years of age, who was rudely accosted and laid hold of in the street by a person under the garb of a gentleman, and she became greatly alarmed and escaped to the house of a relation. Next morning the symptoms of chorea showed themselves. In this lecture Dr. Todd drew the following conclusions respecting the pathology, and considering how long ago this was, we must admit that they were peculiarly good and correct:

1. That chorea is a disease occurring at a time when the nutrition of the brain is passing, as it were, through a state of transition, from that of infancy or very early childhood, to that of the adult period, when that organ is peculiarly prone to suffer from mental shock, or other causes of disturbance of the system, and more especially when the blood is in an unhealthy state, deficient in some of its staminal principles, or containing some morbid element.

2. That the part of the brain mainly affected is the centre of emotion, but that the extent to which it suffers is sometimes limited to one side of that centre, sometimes to both, again extending to the cerebellum or to the corpora striata or optic thalami.

3. That the nature of the cerebral affection is one of weakened nutrition, with some degree of irritation; as poor blood, rendered perhaps impure by the presence of the matter of scrofula, or of rheumatism, or by some morbid matter peculiar to chorea, excites the nervous battery, and causes it to generate its force feebly and irregularly. The centre of emotion thus feebly excited, and irritated by the presence of an abnormal ingredient in the blood, extends its feeble and irregular polarity to that portion of the centre of implantation of the nerves which, as the polar state of the conductors of the battery is regulated by that of the battery itself, exhibit the same enfeebled polarity as the centre in which they are implanted.

Lastly. The disease is one of depraved general nutrition, which must be set right before these symptoms which arise out of the local disturbances can be removed; and this is the point of practical interest which must regulate our treatment of the disease. These conclusions, respecting the pathology of chorea, receive confirmation from the facts to which I have already alluded—namely, that choreic movements occur in certain gouty states, and also in white softening of the brain arising from diseased arteries. Under both these conditions the nutrition of the brain, as well as that of the nerve and muscles, must be depraved and weakened; depraved, especially in the former instance, by the matter or poison of gout; weakened in both.

Dr. Todd speaks of the treatment as one which should be eliminatory and corrective of the various secretions, and at the same time tonic and bracing to the nervous system, by the free application of cold water to the surface, by a nourishing diet, and by chalybeates, quinine, and other metallic tonics. He also recommended galvanism.

On the treatment of chorea Dr. Samuel Wilks, physician to Guy's Hospital, says:

It might be thought by the inexperienced that those drugs which exert a physiological action over the nervous system would be those which would arrest the complaint known as chorea, but, as a matter of fact, this is not the case, so that I have almost given up looking for a remedy in the direction of this class of medicines. I do not despair, however, of finding some drug which might counteract that morbid condition of nervous system which is present in very bad cases, but in the absence of such remedy our ordinary curative means are of little avail, seeing that they can act only slowly and tend to produce a change long after the time at which the acute form of the disease would prove fatal. In these very severe and bad cases we can only hope to preserve the life of the patient sufficiently long for the most approved tonic remedies to act. For example, in such cases as I mentioned just now of children suffering from acute chorea induced by fright, a fatal termination may occur in a few days, and in these

the direct sedatives are suggested. Morphia, as far as I have seen, is useless. I can call to mind two cases where large doses were given, but the effect was only transitory. The same with chloroform; the vapor produces but a temporary tranquillizing effect, and our experience of it is not encouraging either in chorea or in the allied disorders, tetanus and hydrophobia. I have never seen strychnia of any use in the acute affection; and the same of belladonna and conia. In the less severe cases it is possible that one or two of these medicines may be useful, but I feel convinced that the class of medicines of which I speak—those which have a physiological action on the nervous system—are far less efficacious than the metallic tonics. It would seem that in order to produce a cure, a bracing up or restoration of the original nerve-power is necessary, and that the mere subdual of symptoms in no way tends to cure the complaint. When I say this I speak with some little hesitation of the effects of belladonna and conium, both of which remedies I have seen apparently useful. I remember, when at Paris some years ago, hearing Trousseau give a lecture on this disease and warmly recommend belladonna. On another occasion he was declaring that there was no drug in the Pharmacopœia equal to strong coffee, and on a third occasion he was vaunting the new gymnasium at the Hospital for Sick Children as the best therapeutic agent he knew. I mention this to show you that there really is no specific treatment for the disease. I might say that we thought we saw some benefit in one case after the use of cannabis indica, but none whatever in four cases in which we tried the physostigma.

I believe I can tell you something very positive about the treatment of chorea, and I only wish I was enabled to make the same boast in reference to some other diseases. Many years ago, seeing that every medicine in the Pharmacopœia as well as several others out of it, were said to be equal to the cure of chorea, I determined to watch the disease untrammelled by medicine, and I found that in many cases a speedy recovery took place without the administration of any medicine whatever. The cases which did best were the severe ones, excepting always those which were of the most violent and acute description. The first case which I watched was a little girl who had severe chorea; she was too bad to be able to stand, and was obliged to have sideboards to her bed to prevent her wriggling out of it. This child began to improve in a day or two, and went out well in a month. This is only one example of several of the same kind. I take it that the patient, being subject to constant excitement or improper treatment at her own home, has her disease there perpetuated, whereas, when brought to the hospital, being under the influence of strangers who endeavor to make her suppress the movements, and by the additional advantage of good living, she begins to recover. I should say that a weakened condition of the nervous centres being at the root of the malady, good nourishment and the tonic plan are necessary. After having learned the fact that the tendency of the disease is towards recovery as soon as all the circumstances which formerly surrounded the patient were removed, I soon afterwards learned that the cure is expedited by tonic medicines of the mineral kind, and this is the experience of the majority of the profession. I have put the treatment before you in this way to prevent you supposing that such remedies as iron or zinc act in any specific manner; they are useful, but operate as nervine tonics. I believe Dr. Elliotson, many years ago, acquired great fame by his success in the treatment of chorea, his remedy, as you know, being the red oxide of iron. We still give it, and it is one of the best of remedies; our children very willingly take half-drachm doses in treacle. Probably an equally favorite remedy here is the zinc—in fact, it is the medicine most commonly given, beginning with grain doses and increasing to any amount, as a scruple three times daily. A favorite remedy of my late colleague Dr. Hughes was rhubarb steeped in port wine; the children were

thus well kept up at the same time that the stomach and bowels were improved in condition.

In very chronic cases, and those where a part of the body only is affected, medicines are of little use. In some of these electricity has sometimes been curative; in some cases shower-baths have acted with the best success. One writer has advocated the use of liniments, as of chloroform, to the spine. Often nothing less than a thorough change of scene will suffice to break the habit. If this opportunity do not occur, gymnastic exercises are of use. They not only strengthen the muscles and nerves, but they break the bad habit; they convert, in fact, an irregular movement into a regular one. If the arms are constantly moving, and are then employed in grasping a beam for swinging, a new and altered condition of the whole machinery accrues, and in time the habitual irregular actions are worn out. I am sorry that we have not a gymnasium here, and therefore, all I am able to do is to order my patients a skipping rope. I believe the only method by which chorea, which at one time prevailed in religious houses, was sometimes able to be cured was by making the ladies dance to the notes of music.

On the use of Indian hemp in chorea, Dr. Douglas, Vice-President of the Medico-Chirurgical Society of Edinburgh, says:

Dr. Russell Reynolds, who writes one of the most recent, and one of the best expositions of the value of this remedy, tells us, as the result of a manifestly practical and thoughtful experience, that "it is a soporific, anodyne, and antispasmodic; and that it relieves pain and spasm; that it does not leave behind it headache or vertigo; nor does it impair the appetite, nor confine the bowels."

[The patient, a girl 13 years of age, was admitted into the Chalmers Hospital on the 15th of October last. A month previous to admission she had been taken with an attack of rheumatic fever. No symptoms of cardiac inflammation occurred. The choreal action had existed about a fortnight.]

During the day immediately succeeding her admission, a rapid change occurred in the degree of the choreal movements, and in the state of the heart's action. The latter became so disturbed, feeble, and excited, with feeble arterial pulse, as to cause serious anxiety for the safety of the patient, and at the same time the choreic agitation increased with such violent restlessness and rolling in bed that excoriations occurred over the sacrum and both nates, while contortion of the features and tossing of the extremities, especially when their movement was attempted, continued excessive. The articular effects of rheumatism decreased, temperature became more natural, the urine healthy, but the bowels became torpid. The arsenic was persevered with, and a few 30-grain doses of bromide of potassium were given. Each dose was followed by a short period of quiescence, but, on the 20th, the excitement of the heart's action became so alarming that 25-minim doses of tincture of India hemp were administered, followed by apparently marked but only transient abatement of the spasmodic movement, which, as Dr. Hogg, the resident physician, reported, seemed to recur subsequently with increasing and distressing severity.

On the following day—that is, the sixth of her residence in the hospital—her condition seemed desperate, chiefly on account of the protracted and uncontrollable hurry of the heart's action. She was ordered to have *six minims* of the tincture cannabis every hour, the arsenic and other remedies being intermitted. The bowels were now well regulated, the excoriations of the back and nates had increased so as to form superficial sloughs of considerable extent, the pulse was small and so rapid as not to be counted, and the heart's action was still feeble, rapid and disturbed. She had four ounces of

brandy per day. On the following day, having had twenty doses of the tincture, there was a marked and increasing improvement. The violence of the tossing and rolling had diminished materially, though still it was necessary to have her secured in bed to prevent her falling or rolling over. From this time till the 15th day of her residence in the hospital, the tincture was administered from hour to hour, and she continued to make daily and progressive improvement. At that date (the 28th) she had been free of all the more violent spasmodic movements for two days; the heart's action was quiet, pulse about 80, appetite good, bowels regular. She still presented a degree of the peculiar grimace, with awkwardness in protruding the tongue, and in movement of the arms and hands. There was a great mental lethargy, with languor and exhaustion, which made it impossible for her to be out of bed.

The tincture of hemp was now discontinued and arsenical solution in four-minim doses resumed.

The subsequent progress of the case, though tedious, and so far disappointing, may be told in a few sentences. On the 1st of November, and on several occasions during the rest of that month, there occurred a renewal of the choreal state, which had not, indeed, absolutely disappeared, though it was often so trivial, and even absent, as to encourage the hope of an early recovery. Arsenic was perseveringly employed, with a carefully-regulated diet and general management, but on each occasion, of which three were noted, when an exacerbation of the choreic condition arose, a marked abatement of the muscular action resulted from the administration of small and hourly-repeated doses of tincture of hemp, relief sometimes arising so speedily as within six or eight hours. On one occasion the improvement was not detected for three or four days.

In the beginning of December, rheumatic symptoms recurred, with slight febrile action and articular pains, and renewal of choreic agitation. At the same time, marked excitement of the heart's action was renewed, and now, for the first time, a faint, soft diastolic murmur, indicative of aortic regurgitation, was with difficulty perceived. A weak solution of acetate and nitrate of potash was administered, and grain doses of opium four or five times in twenty-four hours. Pain and fever abated, but not the spasmodic movement, and on the third day afterwards six-minim doses of tincture of hemp were given every two hours, followed by an immediate decrease of the chorea, which at once declined to the slightest degree in two or three days.

The patient now presented more marked indications of returning health. The state of mental lethargy into which she had early lapsed was now passing off; her appetite was revived, and on the 20th December she was able to be out of bed and to walk with assistance. Small doses of the iodide of potassium with the infusion of quassia were given, and improvement went on uninterruptedly; she did not, however, cast off the choreic jerk and awkwardness till the second week of January, 1869. She has since had a very comfortable convalescence, but the diastolic murmur noted above continues strongly developed.

The impression which the case leaves on my mind is, that cannabis has a peculiar value and power in controlling the irregular movements of chorea, which ever and again are terribly distressing, and possibly even dangerous, to the patient; and it would be of no small moment to determine the extent and limit of its influence, and to ascertain whether or not choreic action, even in slighter cases, might not be moderated by this remedy.

As to the mode of administering the remedy, small and frequent doses proved both safe and effective, and great advantage appeared to arise from increasing the frequency of the dose rather than its amount. Believing, as I do, that cannabis indica is a remedial agent of value in many and various maladies, I am prepared to recommend this mode of seeking its effects by frequent rather than by larger doses at longer intervals. Such a

mode of prescribing it has not been usual; but I find, quoted from an American source, the account of a case of hiccup treated in this way by eight-drop doses of a fluid extract, administered hour by hour, in which recovery from an attack that had defied treatment for five days took place in a few hours.

CHAPTER XXIV.

VERTIGO.

VERTIGO consists in the sensation of giddiness or moving, or the appearance of moving, of external objects when there is no real existence of movement.

The patient is very much distressed by a sense of a want of equilibrium, of falling or turning round, and the things which are about him appear to swim and oscillate before his vision. The condition varies from a slight sense of unsteadiness or oscillation to such a degree of vertigo as altogether destroys equilibrium, and the patient falls to the ground unless he takes hold of something to prevent him from falling. This sensation is the most powerful when the patient is standing up, but may come on while he is lying down, and even when the eyes are shut. Patients suffering from vertigo complain of tinnitus aurium (various kinds of noises), which, although nearly always present until recovery, is more pronounced during the attacks of vertigo. The cause of vertigo is primarily a disordered and disturbed circulation in the brain, which is proved by the fact that it attends both cerebral anæmia and cerebral hyperæmia. It is very often dependent upon a disordered state of the blood itself, as in fever and in various inflammatory diseases. It may also appear as the result of blood-poisoning, from malarial poisoning, and the injurious effects of tobacco and intoxication. It may be associated with—and generally is connected with—epilepsy, convulsions, and organic lesion in the body. It is very often dependent upon functional disorders of the stomach. It attends disease of the cerebellum and of the cerebro-spinal system. Diseases of the eye and ear are also attended very frequently with vertigo. The vertigo appears in the affections of the eye, when its muscles are involved, and especially

in affections of the ear, when there is disease of the semicircular canals. In disseminated sclerosis the vertigo is an early symptom, and is gyratory, and comes on in paroxysms, and is occasionally almost continuous.

The differential diagnosis between ordinary vertigo dependent upon simple disordered circulation of the brain or functional disorders of the stomach and the vertigo of disseminated sclerosis would be that in the latter case our patient would present rhythmical tremors, affections of the eyes, defect of speech, and an early paresis of the limbs. Contraction of the limbs and changes in the mental condition and expression also are seen in sclerosis. In tumors of the brain vertigo is one of the most constant symptoms, and it is associated with headache and vomiting. In order to understand the cause of vertigo in any given case, we must carefully study the accompanying symptoms. The suppression of either a hæmorrhage of long standing or of a chronic skin disease are both common causes of vertigo. Vertigo, then, may depend on functional disorders of the viscera, or upon organic or functional brain disease, or blood-poisoning, or it may depend upon a weak heart with a dilated right ventricle.

The most common kind of vertigo which we meet with in practice arises from disordered digestion, and can be referred to the stomach, or functional derangement of the liver, or may occur suddenly, either at day or night, and is very distressing to the patient from its violence.

This variety depends upon a sudden arrest of the process of digestion, which produces a temporary functional disturbance of the brain and its circulation. The utmost that any of my patients have ever complained of has been a mere uneasiness over the epigastric region. They have denied the presence of pain after food has been taken into the stomach. In women, we often find associated with this form of vertigo, leucorrhœa, menorrhagia, obstinate constipation, and amenorrhœa, and the fact that after these diseases are relieved the vertigo remains proves the stomachal orgin of it. In this form of vertigo we never find a loss of consciousness, as we may when it depends on organic brain lesions. The patient sometimes is perfectly free from it; an empty stomach and excitement make it worse. Stimulants relieve it, and closing the eye so as to shut out all external objects relieves it. Although a few patients complain of a constant slight sense of vertigo, most of them will give a history of several successive daily attacks, lasting generally a few min-

utes, accompanied by a distressing heaviness in the head. In hard drinkers, we often find the vertigo may last for days, and render them unable to move. The disease depends, in these cases, upon structural alteration of the capillaries, and the symptoms present are nausea and aversion to food. This form of vertigo of which we have been speaking—that arising from disordered digestion—may be effectually relieved by the following treatment: The patient, if a man, must be free from the care and anxiety of business. Upon arising in the morning, a cold sponge or plunge bath, with subsequent friction on the surface of the body with a Turkish towel. No malt liquor must be indulged in. The diet must be plain, regular, and well masticated. Vichy, with a very little brandy, may be used as a drink. The patient must retire early, and sleep in a large, cool room. The following may be taken before meals:

℞.—Pulv. rhei, ... ʒj.
Sodæ carbonat., ... ʒij.
Pulv. gentian, ... ʒij.
Aquæ menth. pip.,
Aquæ dest., ... ää ℥iij.
M. S.—Tablespoonful thrice daily before meals.

Or, five drops of the tincture of nux vomica, a remedy which is an efficient tonic to the whole gastro-intestinal tract, may be given in a little water before each meal. In some cases, an examination of the urine microscopically will reveal oxalate of lime, which produces oxaluria, and may give rise to vertigo. This can be readily relieved by fifteen drops of dilute nitro-muriatic acid, given in water thrice daily before meals. In individual cases with individual complications, relieve these first and improve the general nutrition, and then direct the treatment directly to the vertigo.

A great many cases of vertigo depend for their cause upon drink and mental anxiety. These attacks are of comparatively short duration, and occur every few hours or days. At first the sensations are referred to external objects, and occur only when the patient is moving. As it becomes more frequent, there is an internal feeling of dizziness, which lying down generally relieves. In the male, it is associated with stomach disorders, and in females, with menstrual disorders. The principal symptoms are want of clearness of intellect, incapability of sustained mental effort, with headache. There may be, in cases where oxaluria is present, great irritability of temper, depression of spirits, sleeplessness, and impaired nutrition.

A great many cases of vertigo are connected with lithæmia, and Dr. Da Costa, of Philadelphia, in his able monograph on *The Nervous Symptoms of Lithæmia*, ranks it as one of the principal nervous symptoms of that state which is characterized by the abundance of lithic acid or lithates in the urine. These attacks of vertigo may be violent, and repeated often, perhaps twice or more in the twenty-four hours. Confusion of mind and failure of memory are apt to coexist with the vertigo. Also shooting pains in the limbs and joints. In this vertigo of lithæmia, "objects seem to whirl around the sufferer." The special senses, when the vertigo is frequently repeated, also suffer, and there is apt to be much neuralgia, affecting the brachial, intercostal, and sciatic nerves; and also gastralgia, sleeplessness, languor and lassitude, depression of spirits, and great irritability of temper characterizes these cases.

To cure this form of vertigo, we must cure the lithæmia, which is the cause of it, by a strict diet, eliminating all but the white meats and poultry, making the patient rest from work, exercise freely in the open air; use alkaline purgative waters—Poland water, which neutralizes the uric acid by its alkalinity, and acts freely as a diuretic, as does also the Saratoga Vichy—and citrate of lithia as a medicine, with a course of small doses of arsenic. If such patients are sent where they can live in clear bracing mountain air for a few months, taking exercise, they will make a good recovery and the vertigo will disappear.

Vertigo may be associated with brain disease, and the movements may be gyratory, or a falling backward or forward. Vertigo accompanies nearly all of the organic lesions of the brain, and nearly all of the acute inflammatory affections of it. In the treatment of vertigo from overwork and anxiety, rest, and freedom from all care and work is an essential part of our treatment. If oxaluria is suspected, as I have said, the administration of fifteen drops of the dilute nitro-muriatic acid before each meal will generally effectually remove it, and the bromide of ammonium may be advantageously administered. The treatment of vertigo, complicated with brain troubles, must be guided by the particular group of symptoms which present themselves in any given case. The application of the galvanic current of electricity in all forms of vertigo will be found to be of great service as central galvanization, or by the application of both poles on each side of the sixth and seventh cervical vertebræ, using from twelve to twenty cells, as the case may be.

CHAPTER XXV.

STATES OF UNCONSCIOUSNESS—SOMNAMBULISM—CATALEPSY, ETC.

THERE is great interest and importance attaching to this subject, but we are accustomed to very vague and undefined ideas respecting it. My effort in this chapter, aside from treating of the diseases of somnambulism and catalepsy, will be to contribute, in however slight a degree, to the knowledge of the more exact relations of the human mind and of human acts to responsibility.

We have been accustomed to regard the partial interference with sensibility and mobility, and the resulting limitation of will in trance, trance-coma, somnambulism, catalepsy, and epilepsy, as curious physiological states rather than as diseased states of the nervous system requiring medical treatment, and also seriously affecting mental and legal responsibility. It is only in the most perfectly-balanced minds, where there is an accurate balance between the subjective and the objective faculties, that consciousness is never impaired, and where there are no breaks in the continuity of perception and memory, during which time the connection of the individual with the thing done or said is no longer reliable or distinct. Even in men of the strongest mental calibre such obliviousness sometimes occurs. In whatever these intercurrent spaces of non-existence may have originated, whether from unfettered determination, or the idle wandering imagination, or from the brain-wasting following moral or intellectual hard work, it is certain that occasionally they pass beyond the power and in defiance of the will, and should be classed under the head of morbid nervous affections, if not with actual mental disorder.* Men of lofty intellect and vigorous and acute minds, by excessive and continuous application, overtaxing their attention and introspection, and confining the exercise of their intellect and memory within a narrow range, weaken their observant powers, and by concentrating their minds upon particular objects, produce, oftentimes, grave disorders of the nervous system. Sir Joshua Reynolds and Sir Isaac Newton are prominent examples of attention so long fixed and contemplation so intense as to render them entirely oblivious to self and surroundings and to disturbances in perception.

* This was clearly laid down in the London Journal of Psychological Medicine by Dr. Forbes Winslow some years ago.

After Sir Joshua Reynolds had been for hours occupied in painting and walked out into the street, the lamp-posts seemed to him to be trees, and the men and women moving shrubs. He had fixed his attention for such a length of time on the picture before him that he could not direct it to other objects of sensation.

A very remarkable instance of forgetfulness and absence of mind occurs in the biography of Hookham Frere, the scholar and man of letters, who, handing the Countess of Errol to supper, drank the negus he had prepared for her, and altogether forgot the object of their visit to the dining-room; and who, on the day of his marriage with the same lady, had no recollection, until the evening, that he had promised to accompany his bride to the country, having occupied the intervening time in reading his poem to his publishers. It is a psychological fact, that after the attention has been for a great while intensely fixed upon particular objects, the person cannot direct it at will to other objects of sensation. Any occupation or exercise which narrows the scope of intellectual exercise, which nullifies the influence of the emotions or contracts the mental forces, is directly prejudicial to mental health, by giving undue prominence to certain faculties and allowing others to fall into disuse and apathy, overstimulating some regions of the brain and probably producing undue or defective nutrition in certain parts of the brain. It is the peculiarity of all these states, when they are not merely temporary effects of overwork, that they essentially consist in such consequences of bodily or mental degeneration as, robbing the thinking part of our nature of its nobler endowments, leave it in the impoverishment of an appetite, a peculiarity, or a single all-embracing thought. The morbid element consists chiefly in fixedness—in the inability of the will to substitute another train of reflection or perception. The will, though feeble and fickle, is not entirely extinct, as it serves to guide in the direction of the predominating, if not constantly permanent, notion or incentive. It seems to me that we must class such states in the same category as the preoccupation of the insane, whose disordered imaginations can admit of nothing but the present ruling impulse, and with the absorbing and exclusive anguish of the melancholiac. In all these cases there exists, in different degrees, a suspension of consciousness. These spaces of non-existence are on the border line which divides sanity from insanity. The morbid states of the brain which may be induced are exemplified in a marked degree in the lives of ascetics and ecstatics, and in those

whose intense devotional feelings, as in the convulsionaries and Brahmins, extend, for the time, to enfeeblement of volition and to diseased functions of motivity and sensibility, manifested in violent convulsions and complete loss of sensation.

In *somnambulism*, the first of the morbid states which I propose to consider, we have, as the constant and unvarying state, a morbidly profound sleep, in which "the sceptre of reason is surrendered to a physically directed fancy." It is due, probably, either to an overloaded stomach pressing on the solar plexus of nerves, producing a partial paralysis in the coats of the arteries, and so in the circulation of the brain; sleeping with the head too low, and strong mental emotion. It is a peculiarity of somnambulism that even after the removal of the cause, the habit, once established, is apt to remain. It is most frequent in youth, and about the age of puberty. In the states of unconsciousness accompanying somnambulism, the senses are awake and preternaturally alive. The muscles are regulated, and regulated, too, with wonderful precision and power. There is a purpose, and there is a coördination of acts for its accomplishment; but consciousness is still asleep, and memory retains no record of the transaction, although it may have been prejudicial in the highest degree to the interest of the actor or of others. In many states of unconsciousness the mind is forced to think or feel in a particular way, and is forced to instigate certain deeds in flagrant opposition to its ordinary character and tendencies, and in utter disregard of the promptings, or of the resistance of other motives and considerations. There is a very close relation between acts committed during states of unconsciousness and mania transitoria, epileptic paroxysms, and the irresistible impulses of insanity. They have, in common, irresistibility, suddenness and rapidity. They are alike unannounced and of short duration. They are alike characterized by the exercise of free-will being fettered or perverted, and there are, undoubtedly, distinct morbid conditions in all of these different states. If we examined with sufficient care, cases in which unconsciousness occur, I feel quite sure we should discover the prodromic signs which have been observed to usher in other species of the neuroses. Somnambulism may be hereditary, but it is not inconsistent with fair health. It is apt to become periodical, patients having attacks once a week, fortnight or month.

The *treatment of somnambulism* consists in preventing the very deep sleep, in which the phenomena of somnambulism are exhibited.

The patient should be awakened one or twice a night before the phenomena begin to appear; soon after retiring and again after four or five hours sleep, will usually answer. Patients should dine in the middle of the day, and while taking care that all meals should be light and digestible, we should be particularly careful not to overload the stomach at night. The use of electricity and nerve tonics to bring up the general health to the highest point are indicated. Friends should be cautioned not to awaken the patient while walking, as the fright may act prejudicially. He should be quietly put back to bed. The head should be well propped up by pillows, and too great a weight of clothes must be avoided.

Catalepsy.—I find an excellent definition of catalepsy in Dr. Boerhaave's aphorisms, published in 1755. He graphically describes it as "that disease in which the patient becomes of a sudden unmoved, void of feeling, and retains the same posture and action of all the parts of his body which it was in when the disease seized him first." It is a disease of central innervation of the nervous system, and may be accompanied by or accompany many forms of insanity. In a cataleptic paroxysm, the state of unconsciousness is characterized by the limbs of a patient remaining in the position in which the patient had placed them before the inception of the paroxysm, or in which any bystander may place them during the paroxysm. Consciousness and sensibility are entirely suspended. Catalepsy may accompany insanity and chorea, and many of the neuroses. If death is simulated, the existence of muscular contractility under the Faradic current, and also the dark eschar of the cautery, are tests which may be applied to determine life. The patient's will is powerless to act during the paroxysm, by reason of the muscular contraction induced by excitement of the motor nerves, proceeding from the spinal cord. The paroxysm is preceded by dizziness, headache and a very irritable state of the general nervous system, and begins very suddenly.

There is apt to be a vague uneasiness and sleeplessness. A patient of mine presented the following typical symptoms and manifestations of a cataleptic attack in my presence. The lady in question, who was from North Carolina, while in the act of conveying a morsel of food to her mouth, became suddenly rigid and pale, the arm being arrested in its passage and being immovably fixed, with the fork in the hand a few inches from the mouth. The whole body was as motionless as if the patient were carved out of stone. The eyes presented a widely opened, staring condition, and consciousness and

sensibility were entirely suspended. Respiration could not be detected and the pulse-wave could not be felt at all. In about four minutes the patient sighed deeply, made a full inspiration, and resumed her meal, quite unaware of what had happened to her. The cataleptic trance may last for some hours possibly, and in extreme cases may last for days. Patients remember nothing of an attack or what transpires during the trance-like state.

Catalepsy, although not necessarily connected with insanity, is, I think, very often dependent upon an insane temperament or neurosis. It has been stated that catalepsy is generally a complication of hysteria, but the results of one hundred and forty-eight cases collected by Dr. Puel, in which sixty-eight occurred in males, would seem to disprove the assertion. An interesting case of this rare disease was reported by Dr. S. S. Cornell, of Toledo, Ont., not long ago. The catalepsy came on after the second confinement, before which the patient was very nervous. After the confinement there was a chill followed by sharp febrile action, with pain and tenderness over the region of the uterus. There was some delirium and suppression of lochia. This condition, however, disappeared, but was followed by a cataleptic state, which I give in the Dr.'s own language: "Now comes the sequel. The patient passed the next forty-eight hours most beautifully, except on the night of the 30th she could not sleep; otherwise the nurse thought she was doing extremely well. A peculiar change was soon discovered taking place with the patient; her acuteness of hearing was extremely great; could hear and reiterate the sentiments of persons in the adjoining room, who conversed, as they declared to me, in a low whisper, and that they conceived it impossible for a person to hear a word whispered six feet from them; yet this patient at a distance of twenty feet or more, with closed doors, could tell the sentiments exchanged. This was done several times, and finally the patient called her husband to her, kissed him; then called her little boy three years old, and her infant, kissed them and then bade her friends adieu. This procedure of my patient awoke a deep interest in the minds of the nurse and friends, who now became alarmed. The nurse persuaded the friends to leave the room to her and the patient, as she thought after a little, Mrs. H. would fall into a repose; but instead of sleep, our patient lay speechless and motionless, with eyes staring wide open, no signs of respiration; they opened her mouth to see if she would swallow, but in vain; her lower jaw remained depressed as the nurse had left it. Attempts

were now made to rouse her by calling loudly in her ear, but to which she paid no attention. They thought her dead, and that it was useless to send for medical aid; thus passed away twelve hours, when her husband dispatched a messenger for me. When I arrived and entered the room, I was shocked to see what struck my fancy to be a waxen figure or a frozen corpse in lieu of my former patient. There she lay with under jaw depressed, eyes staring and wide open, without winking, the pupils a little dilated, skin cool, almost the feel of a corpse before stiffening, pulse 122, feeble, no sign of respiration. In examining the pulse I raised the arm to see if that would cause any difference in the pulse. There it remained for nearly an hour, when I put it down by her side. There was but little resistance offered to any change of her limbs or person; but whatever attitude a limb was placed in, there it remained. I now brought her under jaw up to its place and it remained. I was importuned to do something for the patient. What to do was with me a paramount question. The thought occurred to me that I might administer an enema of strong solution of assafœtida, which I did to the amount of a quart; and this was very easily done as there was not the slightest resistance. Still the patient lay as lifeless as ever for about an hour, when a few slight convulsive movements were observed, and she roused to consciousness. She looked about her, asked what had been done with her corpse, as it appeared to her that her friends desired her to remain for a season, but her judgment dictated to her to again depart and take her infant with her. I gave her several doses of assafœtida, fluid extract of valerian, beef tea, etc. She now desired to be left alone, as she said she had an important duty to perform, and the presence of persons, however nearly related, was detrimental to her welfare. She was satisfied for me to remain with her alone, as she said, "from the days of antiquity, deference had always been paid first to the priest and then to the doctor." She remained quiet for, in all, a period of six hours, taking beef tea, valerianate of ammonia, assafœtida and bromide of potassium. Soon she drew the sheet over her face, and then placed her arms over her chest and lay straight in bed; she lay so quiet and still that I felt induced to remove the sheet, when, as I had feared, I found her in a second trance (?). Eyes wide open, pupils a little dilated, but would contract under the influence of strong light; skin cold, of a death-like feel, no rigidity of the muscles; pulse 112 and very feeble; not the first sign of respiration, no movements of the nostrils. I now lifted her body up to

an obtuse angle with her lower limbs, I next raised one arm and then the other, and in this position I left her for several minutes. I now stepped back, gazed upon my patient, who, in a semi-sitting posture, with staring eyes, with outstretched arms and a lifeless appearance, appeared as though a corpse had thus been placed and left to stiffen.

I then laid her down upon the pillow, raised her body up, having her head on the pillow in the attitude of opisthotonos, and thus she remained; after a period of twenty minutes, I gave her a slight push and she fell on her left side with her body still having the same curve, I now straightened her out in bed, spoke loudly to her several times, but no response. I again repeated the assafœtida injection, containing ol. terebinthinæ. To please her friends, I tried several times to have her swallow, but all to no purpose. I held to her nose strong aqua ammonia, which affected her in no perceptible way. In this state she lay about eight hours; when consciousness returned she related what she saw while in the other world. This time she was not so composed and tranquil as when she came out of the first trance (?). Her symptoms now assumed more the character of hysteria, her limbs were affected with convulsive twitchings, and she screamed loudly without giving utterance to any cause for so doing. When she went into the second state of mental abeyance, my views were, as soon as consciousness returned, that she should be brought under some powerful anæsthetic, whereby her mental state might recuperate. Whether this should be produced by chloroform, ether or hydrate of chloral was not fully settled in my mind. I therefore sent for Dr. Addison of Farmersville, who arrived just after her imperfect return to consciousness. It was decided at once to give her hydrate of chloral, of which she took seventy grains in the space of an hour, after which she fell into a profound sleep and did not awaken for twelve hours. Her convalescence then commenced."

These cases are of interest to the practitioner, although comparatively rare, as the cataleptic paroxysm or fit annoys or disturbs the patient's mind, lest they should come on while travelling or away from home and friends. Although the fits generally last but a few minutes they may possibly last for several hours or even days. The chief indication for treatment are to improve the general nervous tone by nerve tonics and electricity; induce the patient to lead an outdoor life, eat regularly, avoid rich indigestible food; to retire early; and if the patient complain of a sleepless condition to administer the ammoniated tincture of lupulin, made by William Neergaard,

the chemist of this city, in twenty-minim to one-drachm doses, or Fothergil's solution of hydrobromic acid in thirty-drop doses, in water, at bed-time. I have found the constant current of electricity useful in the form of centric galvanization. To recapitulate: Catalepsy comes on suddenly, generally after mental or emotional disturbances; the body becomes corpse-like and pale, the respiration being slow, and the pulse very soft and, perhaps, not discernible. The patient cannot be roused, and sensibility is lost. The stiffness of the muscles is a diagnostic feature of the disease, which is such that if a limb be put forcibly into any position it retains it. Patients remember nothing of any attack or what transpires during its continuance.

In all states of unconsciousness, where there is disseverment of the will from the organs habitually acted on by it, and during which odd, eccentric or dangerous acts are committed, it would seem most probable that while memory is annihilated, the acts are the outcome of the sensations, ideas, emotions, acts and events of antecedent life, and not inventions new to the senses. I doubt if the mind ever actually ceases in its operations or workings; and it is probable that actions analogous in kind although variously altered in operation, occur in the brain, alike in unconscious and conscious states, in much the same manner as they occur in the sleeping and in the waking brain. It is a very difficult matter to try to define or explain mental action in these states, because there are as many forms and degrees of disordered mental action in states of unconsciousness as of the intellectual and moral qualities in their sane state. The confused and perverted notions of right and wrong in opium habitués, where the opium dulls and deadens the moral sense without seeming to disturb the intellectual faculties—owing to the close relation between opium and consciousness—have a very interesting medico-legal bearing, as these cases inhabit, more or less of the time, a realm of partial unconsciousness; but this subject is too complex to admit of further mention in this paper.

The instigation to give way to inexplicable and ungovernable impulse, to cry out or shriek, to perpetrate a homicide or suicide, or to commit some motiveless act of violence or otherwise, and some of the acts of kleptomaniacs, come under the head of states of unconsciousness.* In families where madness is hereditary, there would

* At the time of writing this a patient, 15 years of age, tells us that she should feel "so much better if she could only kill somebody." Who, she cares not. There is a strong impulse to commit the act.

seem to be a similarity or identity of the inner nature of different members of the same family, which would appear to incite them to the act of self-destruction without any appreciable incentive to the act. The suicidal act or deed in such instances is probably committed during a temporary partial state of unconsciousness.

In the case of the young English lady of wealth and refinement who, while expensively dressed, took a greasy piece of meat from a butcher's shop, placing it between her velvet jacket and her silk dress, and walked off with it—is it rational to suppose that she was conscious of what she was doing? There is certainly a modified state of consciousness in kleptomania which makes the victim of this unhappy disease but very imperfectly conscious of the nature of the act. When this morbid propensity appears, it generally comes on suddenly, and is, I think, owing to some peculiar change in the nervous constitution of the woman—for it is generally women who are affected with this type of nervous disorder. An uncontrollable impulse seems to usurp the whole mind for the time being, and efface all other impressions. It seems to annihilate personality by excluding all the relations which determine it. I have in my own mind, determined the invasion of insanity in patients who acknowledged such instigations as I have spoken of, to homicide or suicide, which they had not given way to, but which had excited their amusement rather than their appreciation, as in a sound mind would be the result. A patient of mine, who appreciated his own condition, confessed to me that he dreaded to look at children, because, although he was very fond of them, he felt irresistibly impelled to kill them. He related to me a struggle in his own mind which occurred upon seeing a child on the deck of a steamer, in which he successfully resisted the impulse to throw the child overboard. He said that he experienced a dreadful mental contest, and that his head swam and everything looked black before his eyes. He knew perfectly well that it would be wrong to commit such an act, but his will-power was very nearly overthrown by the disease. A lady, who was under my care, was irresistibly impelled to suddenly shriek aloud at any moment, and struggles hard against these impulses. She is accustomed to have momentary periods of insensibility—caused, I think, by anæmia of the brain—in which she steadies herself by a table or chair, and generally manages to avoid the observation of those in the room. This lady, although sane in the eyes of the world, has twice attempted suicide, and in common with other insane acts these attempts have never caused her a moments' regret,

although I have repeatedly endeavored to elicit such an expression from her. There is a taint of mental disorder in the family. Another lady lately came to this city from Massachusetts to consult me about an irresistible impulse to throw herself from any horse car, steam car, steamboat or moving vehicle she was in. She deeply deplored this impulse, but it completely overpowered her, and she lived in fear that she should give way to the impulse. She had a lady friend accompany her constantly. In this case the cause was evidently dependent upon anæmia of the brain and spinal cord. An appropriate course of treatment cured her. There was not the element of insanity in her case. She complained, however, of lack of complete consciousness at such times, which fact she appreciated, and, therefore, never trusted herself alone. I desire to call especial attention to the fact that there are, preceding many states of unconsciousness, premonitory conditions of sadness, peevishness, irritability, quarrelsomeness, torpidity of conception, failure of memory, obtuseness of ideas, hebetude and prostration, followed, as the climax appears, by excessive gayety, excessive exaggeration of physical strength, restlessness, vertigo, and passionate outbursts of fury. There are also in these states headache, vomiting, and neuralgia.

These constitutional states of morbid action show us that it would be very difficult for the mind to act calmly or clearly, and they also show a predisposition to actual mental disorder. These premonitory symptoms should always be inquired after in medico-legal investigations, as they are really a part of the diseased state of the nervous system, and often precede the outward explosion for months. They constitute a part of the disease in the same way that the premonitory aura constitutes an integral part of the epileptic fit, when it is present.

I think more importance should be attached to the subject of uncontrollable impulse, and the legal profession should believe in its existence. At present, acts of unconquerable and destructive impulse occurring in persons whose sanity has never been disputed, are generally visited by the extreme penalty of the law. These persons, however, I think, suffer from a condition not unlike the first stage of epilepsy when pallor of the face occurs. In these cases of uncontrollable impulse, there is a condition of vascular tonus causing pallor of the face before the act, and the impulse ceases upon the commission of the act. I contend that in many of these cases there is disease of the brain, and that many of these persons are morally irresponsible, especially as it has been shown that these impulses are

recurrent. The uncontrollable impulse is unlike epilepsy in that there is no complete and sudden loss of consciousness, while it resembles it in the recovery being rapid, and in the fact of the patient having no remembrance of the attack in many cases. These patients will tell you that they feel an ungovernable impulse to "do something." If the "doing something" consisted of undressing and shrieking from the top of the house, you would all say, "poor creature! she is insane;" while, on the contrary, if the same person seized a knife and committed a murder, the people would assuredly hang her, although the deed would be equally that of a temporarily insane woman, committed during a state of partial unconsciousness—for I hold that these individuals are only very imperfectly conscious of their deeds. I consider these attacks as closely analogous to incomplete and abortive epileptiform attacks, and this should be accepted, I think, as their medico-legal significance. In these incomplete epileptiform attacks there are no convulsions and no complete loss of consciousness, the period being a mental blank to the patient, or a gust of passion, or a slight incoherence, or slight vertigo perhaps. I think that there is a functional brain disturbance in these cases of uncontrollable impulse, consisting of disturbance of the vaso-motor nerves, which are distributed to the bloodvessels of the brain and form their calibre, the disturbance consisting of a condition of spasm of the bloodvessels and temporary anæmia of the brain, evinced by the pallor of the face, which, as I have said, accompanies the uncontrollable impulse and generally characterizes it.

The difference between the epileptic state and that of the brain in uncontrollable impulse is, that in the latter case the state of anæmia is not followed by the congestion and hyperæmia, which in epilepsy immediately follows, as a rule, the state of anæmia. The motor tract of the brain and spinal cord is probably not affected as in epilepsy. If this uncontrollable impulse led to suicide, would you not consider it as the deed of a person who temporarily was of unsound mind? If so, should not the impulse leading to murder deserve any amenity and leniency in treatment? I think that uncontrollable impulse, in common with epilepsy, insanity, chorea, etc., has a common origin, that origin being constitutional disease, or hereditary disease, which has been transmitted from some member of the family, more or less remote, to the patient under observation. It is a medico-legal point of great importance which should be borne in mind, that there is a correlation of morbific forces—first thoroughly demonstrated by Dr.

J. M. Winn, of London, England—which applies to a large class of hereditary diseases, making them mutually convertible; in other words, that there is, in hereditary disease, a latent morbific force, which accumulates, perhaps gathering intensity during the latent period, and finally manifesting itself outwardly by a maniacal attack, in the convulsive movements of epilepsy, in consumption, in a suicidal act, or in the giving way to an uncontrollable impulse to jump from a house, kill a child, or violently swear and use obscene language when the general moral character may have been for months most unexceptional. It is a terrific thunderstorm of the mental and moral nature, due to the explosion of this subtle morbific force, which may have remained latent for a long time. The point which I desire to impress is this: that if, in medico-legal investigations, the judiciary in all such cases will take the same trouble to institute close inquiry that an experienced physician does, they will, in many cases, easily discover the existence of hereditary disease, which greatly modifies the prisoner's moral and legal responsibility; and surely every prisoner is entitled to the benefit of such an investigation, if it is claimed that the criminal action was the offspring of disease which was not under the control of the unhappy sufferer. I hope I shall so convince my readers that it may be said in after years, that the medical profession is entitled, to the credit of inaugurating in this country the reforms so much needed. I have been told once or twice by legal friends that these were dangerous doctrines; but I hold that a scientific truth is never a dangerous doctrine, and I do not believe it right ever to sacrifice a human life to a cautious conservatism that fears to accept a truth because that truth may be in opposition to traditional dogma. I come, finally, to the most important of the states of unconsciousness, that connected with the disease of epilepsy.

Epilepsy is a functional disease of the nervous centres, the phenomena of which morbid state consists in seizures, generally sudden in their invasion, and preceded, as a rule, by a well-marked prodromal period, characterized by loss of consciousness, coming on suddenly, and attended by peculiar involuntary muscular movements, which are highly spasmodic and convulsive in nature. There is great medico-legal importance attaching to epilepsy, from the reason that *there have probably been more grave crimes committed by persons epileptically insane than during all other states of unconsciousness put together in the annals of medicine and law.* I will go farther, and say that I believe most of the *revolting and motiveless* crimes in the annals

of history to be due to the epileptic state. Revolting and motiveless crimes often form substitutes for the epileptic paroxysm, just as periods of faintness or automatism often take the place of a fit. Whether or not the tragedies, like the one I shall shortly relate, are ever premeditated in imagination during the period of incubation of the fits, is, I think, a very difficult question to answer. The state of unconsciousness occurring in epilepsy may be substituted by any grade of sudden acts of fury and violence, homicide or suicide. A premonition of an epileptic fit has been followed by a state of unconsciousness, during which, instead of having the convulsion, persons have walked long distances, in one instance as far as eight miles. The recollection in this instance was a complete blank. If any catastrophe had been the result of this period of walking coma in these cases, during which time there was a total suspension of present knowledge and memory, I am afraid that the plea of temporary unsoundness of reason would have been looked upon with decided suspicion; yet the series of psycho-physical disturbances in these cases, whether apart or identified with an epileptic diathesis, directly affects the soundness of mind. The most insidious of these states of unconsciousness is that which dates from the close of the *grand mal*, or fully developed epilepsy, with convulsions. This state may continue for some days after an epileptic convulsion, and the patient appears so much like himself as to deceive even his friends into the belief that he is mentally normal. This state seems to be compatible with many rational actions, and its existence is not generally suspected until the commission of some crime, like the poisoning about to be spoken of, which succeeded a nocturnal fit of epilepsy. My opinion is, as it will be seen in the narration of this case, that there should be immunity of punishment to epileptics for criminal acts committed within three days before or after an attack, such act being evidence to me of mental unsoundness.

In conclusion, I will speak of the psychological aspect of the Laros case, on the trial of Allen C. Laros, at Easton, Pennsylvania, for the murder of his father, Martin Laros, by poison, the defence being based upon the allegation of epileptic insanity. The history of this very interesting case was kindly given me by my friend Henry W. Scott, Esq., of the Pennsylvania bar, to whom I am indebted for it.

The Laros family lived at Mineral Spring, situated on the Delaware River, in Northampton County, four miles above Easton, Pennsylvania. The little hamlet consists of a tavern and the homes of

seven or eight families, near together, along the river road. Martin Laros, the father of the family, was fifty-seven years old, and his wife was fifty-one. They had lived at Mineral Spring for thirty years. He taught school during the winter months, worked his farm in the summer, and at the same time was employed as undertaker and cabinetmaker. He was quiet, unobtrusive, and respected in his neighborhood. Mrs. Laros was a woman of domestic habits and lively temperament. They have had seventeen children, thirteen of whom are now living. Several of them have been school-teachers. Some are living in the neighborhood, and others have removed to a distance. At the time of the poisoning, the family consisted of the father and mother, Allen (the prisoner), Erwin, Alvin, Clara, Alice, and a very young grandchild. Moses Schug, also a member of the household, was a bachelor, sixty-two years old. He assisted Martin Laros on the farm and in the shop.

One evening, while the family were at the supper-table, they were, one by one, taken violently ill. Neighbors came in to do what they could for the sick, and physicians were summoned. Allen also assisted in caring for the sick; he was taken sick later in the evening. Mrs. Laros died at seven o'clock the next morning. Mr. Laros also died on the same day, about noon, and Moses Schug at three o'clock on the following afternoon. The other members of the family recovered in about a week. The fatal supper was partaken of on Wednesday. The coroner's inquest was begun on Thursday afternoon, and on Saturday the following verdict was rendered: "That the said Martin Laros, Mary Ann Laros, and Moses Schug came to their deaths from the effects of arsenic poison, administered in coffee, on Wednesday evening, May 31st, 1876, and that we believe the same was administered by Allen C. Laros."

A warrant was issued at once. Young Laros was arrested as he lay sick in bed, and taken to the county prison at Easton, Pennsylvania. The prisoner was about twenty-six years of age, a little under the medium height, and slightly built. He had received an ordinary common-school education, and was fairly intelligent. He was temperate, industrious, and moral, and was a church member. He was always disposed to be somewhat reticent, and spent much of his time alone. He was of respectable parentage, of healthful surroundings, of good moral and intellectual training, a teacher of the young in one of the public schools in his own township. He was, however, an epileptic, the epilepsy manifesting itself more than four

years before the poisoning took place, and had continued, by successive steps of longer or shorter duration, until the time of the poisoning. For three weeks before this time, almost daily, he was so afflicted with epileptic convulsions as—so counsel for defence claimed—to dethrone his reason and destroy the powers of his mind. It was claimed and proved that, on the Saturday previous to the crime, he was afflicted with convulsions; that he had them on Sunday, Monday, Tuesday (the day the Commonwealth claimed he bought the poison), on Wednesday (the day of the poisoning), and on Thursday and Friday, immediately after it. After his confinement in prison he was similarly affected by these convulsions, varying in duration from a few minutes to several hours. During the continuance of the convulsions he was totally unconscious. Before and since his confinement, for a period of several hours after these convulsions had passed away, his mind was cloudy and confused, and his conversation and acts not responsible.

My own opinion has always been that, in the event of a criminal act by an epileptic, we should suspect mental disorder, and that, in the absence of any strong personal motive, there should be immunity of punishment to epileptics for acts committed within three days before or after an attack, such insane acts being to me the evidence of an insane mind. Such persons are, I think, able to conduct their business, and perform their duties, and continue their pursuits in all respects like other people, except at the time of seizure. In the case of young Laros there was an inherited tendency to insanity and nervous diseases for several generations, and in many branches of the family of the prisoner—grandfather, grandmother, and maternal aunt. These circumstances all contributed to lower the grade of his offence, even if it was not the offspring of decided insanity.

While young Laros was in prison awaiting trial every possible experiment was tried to ascertain if he were conscious while in the convulsion, and every conceivable test applied to see if the prisoner were feigning. The prison physician, during the first paroxysm he witnessed, suddenly thrust the blade of a sharp knife into the prisoner's hand, and no sensation was manifested. A heated key was next applied. Then the flame of a lighted lamp was held to the sole of his bare foot, and still not a quiver of sensation followed. Melted sealing-wax was dropped upon the bare skin so that the sealing-wax burned into the skin, and no indication of pain was shown. Nothing that science could suggest was left untried to detect imposture, if any

existed, but all these tests failed to detect any feigning on the part of the prisoner. At the trial, Dr. John M. Junkin, of Easton, Pennsylvania, testified that he was called upon to visit Martin Laros on the morning of June 1st. Reached there about three o'clock and, concluding from the symptoms that they were all suffering from arsenical poison, he gave stimulants and hydrated peroxide of iron. He found his patients vomiting and purging, and gave it as his opinion that the death of Martin Laros was caused by arsenic. During the progress of the trial various persons testified to having been aware of the prisoner's infirmity, and the deputy warden of the county prison testified as to the nature of the attacks while Laros was in prison. He described finding the prisoner "struggling in his cell in a fit," with his face very white, eyes partly closed, the hands clenched, with the thumbs inside, and that he heard the prisoner's teeth gritting. He also described incoherent and apparently insane conversation of the prisoner, and hallucinations of sight. The prison physician also testified that he found him—with a weak and feeble pulse and cool, pale skin—acting in a wild, incoherent manner; talking about fishing, seeing water-snakes, and other nonsenical, insane conversation. Any bright object, he would endeavor to get hold of. His pockets were stuffed with bits of paper and such things. He tried to get the warden's shoe-buckles and the bright tips of the doctor's shoestrings. The doctor also testified that he, the prisoner, did not appear to have good control over his muscular movements. The doctor also described various epileptic convulsions which he witnessed, and testified as to the total unconsciousness of the prisoner during the paroxysms. He also testified to seeing the prisoner six to eight hours before an attack, when he appeared dull, and gave imperfect answers, and complained of pain in the head. The prisoner's condition while under observation, coupled with the testimony of his friends as to his previous symptoms and condition, led all unprejudiced observers to believe that he was mentally unsound. Dr. John Curwen, the Superintendent of the Pennsylvania State Lunatic Asylum, testified that he considered frothing, swelled veins in the neck, and lividity of face as essential symptoms, and without these he would doubt the genuineness of the epilepsy, although, on re-examination by counsel for defence, he admitted that these signs might possibly be absent in cases even of pure epilepsy. Dr. Curwen was expert for the Commonwealth of Pennsylvania. The jury in this case rendered a

verdict of murder in the first degree, and the prisoner was duly sentenced to be hung.

The death-warrant was signed, but a writ of error was sued out in the Supreme Court of Pennsylvania, which operated as a *supersedeas*, and the governor recalled the warrant. The counsel for the defence then presented to the court a petition alleging mental unsoundness, and asked for a commission to inquire into the matter and ascertain whether the prisoner was a proper subject for capital punishment. The commission appointed by the court consisted of Dr. William Pepper, of Philadelphia, Dr. S. Preston Jones, also of that city, associated with Dr. Kirkbride, at his asylum, and Hon. Henry A. Ross, a lawyer of Pennsylvania.

The commission spent a month or more in taking testimony and making a personal examination of the prisoner. They made a unanimous report to the court that he was an epileptic and mentally irresponsible, that he should not be visited with capital punishment, and recommended his removal to an asylum. Thereupon the court ordered him to be removed to the State Lunatic Asylum, at Harrisburg, Pennsylvania, of which Dr. Curwen is superintendent. After confinement for a period of about two years he escaped, and subsequently was captured in Arkansas, or, rather, he surrendered himself to the authorities and requested them to "send him back to this country to be hung." He didn't want to be returned to the asylum. He was returned to the asylum, and about six months ago he escaped from there a second time, and nothing is now known of his whereabouts.

The able efforts in his behalf and in the cause of humanity are owing to the exertions of his counsel, Henry W. Scott, Esq., of Easton, Pennsylvania. Upon his examination the prisoner declared that his father and mother were both living and that his father was making a door when he left home. One of the prisoner's brothers was, up to the time of his death, a quiet, uncommunicative, and retiring man, and he died by hanging himself without apparent motive or cause. Young Laros was a person of uniformly mild and tractable disposition, who was brought up amid the softening and restraining influences of a pious and affectionate family and away from demoralizing surroundings or vicious companions. This outrageous and enormous crime was very likely the outcome of mental disorder which had depraved and eclipsed the moral faculties. Yet the judge and jury deliberately arrived at a verdict which doomed this unhappy

creature to the scaffold. In reviewing this case psychologically we have, as I have said, a mild-mannered boy, of previous exemplary behavior, uniformly kind and affectionate, suddenly developed into an inhuman monster of depravity. For four years he had been afflicted with epilepsy, and we must bear in mind the tendency of epilepsy to generate the insane impulse to crime. We must also bear in mind that there are on record many homicides committed by epileptically insane persons under every circumstance of apparent motive and design. There was a rapid succession of the spasms shortly before and after the Wednesday night on which the family were taken sick. These attacks had been noticed more particularly during the few months preceding the tragedy, and they had occurred with startling distinctness and frequency, and on the very evening of the murder he was unquestionably under the influence which precedes and follows the epileptic paroxysm of epileptic insanity. The experts for the Commonwealth in this case adopted the typical case of epilepsy as the unvarying standard by which the disease is to be ascertained, and it was only under the most rigid cross-examination that they would modify, in some degree, this position. The symptoms of epilepsy are not, however, invariable. There may be every variety, from the simply vertiginous to the most demonstrative muscular and nervous spasms. The epileptic may be pallid or purple-hued, the pupils may contract or dilate, the fingers may be clenched or extended, there may be foaming at the mouth or it may be absent. That some of the symptoms of the most decided and impressive type are not present is no proof that the disease is not epilepsy. The disorder of the intellect which accompanies epilepsy is similar to that we meet with in chronic insanity, and while, of course, it is not the invariable rule, yet in my own practice I have, in the great majority of cases, observed enfeeblement of memory and intellectual powers amounting to insanity. While an epileptic may be very intelligent, I do not believe that, either during the attack or for an indefinite period subsequently, the mental faculties are under the control of the patient. The patient, particularly as the effect of the lighter seizures, becomes very irritable indeed, and there are instinctive impulses, I think, to acts of violence. The confused recollection of what has happened and the unconsciousness of the gravity of his acts is, I think, diagnostic of the mental state of the epileptic, and should be considered as the essential characteristic of it. The epileptic, in the majority of cases, seems to automatically

obey the impulses generated by his disease, and seems utterly powerless to resist them, even though they impel to criminal deeds. This constant disturbance of the affective and intellectual faculties which is manifest after the paroxysm, may last during the greater part of the interval between the fits, and this is a medico-legal point of great importance. There may be abortive epileptiform attacks, where there are no convulsions and where there is no complete loss of consciousness,—a sort of epileptic vertigo,—and yet such persons have committed sudden deeds of violence, and were utterly unable to remember the circumstances afterwards.

I think there are cases where the *petit mal* of epilepsy may continue for hours, where no overt act happens, and where there is no motive for falsification. There is also, dating from the close of the *grand mal* an insidious and obscure state resembling healthy mentalization, and differing from it only by a complete unconsciousness compatible with many rational doings. This state follows the convulsion, and is very dangerous to those around the patient. The acts in this state are closely allied to the state of unconsciousness in somnambulism. There is no knowledge or recollection of events that occur, or of overt acts that may be committed during this state. Baillarger relates the case of a vine-dresser near Lyons, France, who was seized with a fit of shivering, and who took up a mattock and killed three of his children, and not but a few rods from that spot he killed his wife and last child. He was much attached to his wife and children. Falret relates a case of a youth liable to vertiginous seizure, so severe as to occasion him to grasp the nearest object for support, who attempted to poison himself, was not excitable, would leave his business abruptly, walk seventy-five miles from Paris, taking no food for forty-eight hours, would forget his ordinary work, would walk during the night, wounded a lady in the street and remembered nothing of the assault. The unconsciousness or mental weakness the sequela of epilepsy permits of the existence of delusions—morbid mono-ideaism, irresistible impulse, and murderous instincts, which regulate automatically the volition and acts of the patient. This is a scientific and well-attested fact. There is only partial responsibility in this state.

*The Mental Condition in Hypnotism.**—Dr. D. Hack Tuke, in his address on this subject before the Medico-Psychological Association

* I would define *hypnotism* as a morbidly profound sleep of the cortex of the brain while the basal ganglia remain unaffected and in their normal condition.

in London, February 21st, 1883, said that he had tried to form a clear idea as to the cerebro-mental condition of hypnotized persons. The data upon which we have to form an opinion or construct a theory are :

1st. The condition necessary to induce the state in question.

2d. The objective symptoms of the hypnotized so far as we can observe them ; and,

3d. The subjective state experienced and described by himself (the hypnotized person), in those instances in which memory, more or less distinct, is retained of what has been present to the mind during the hypnotic condition.

1. *As to the Condition Necessary to Induce the Hypnotic State.*—Staring at a disk or some well-defined object is a very frequent method. Other methods are also effective. The monotonous sensory impressions produced by passes, by counting up to several hundred figures, by listening to the ticking of a watch, etc. We may throw ourselves into an hypnotic state in attempting to go to sleep. The *principles common to the various modes of hypnotism is on the physical side, the stimulation, more or less prolonged, of a sensory nerve in close relation to the brain, calculated to ultimately exhaust some portion of that organ, and on the mental side, the riveting the attention on one idea.* Looking at an object is not essential, for a blind person may be hypnotized, and in susceptible persons the merely expecting to be hypnotized is sufficient to induce it, the expectation in this case involving the concentration of the attention to one point.

Mr. W North, Lecturer on Physiology at Westminster Hospital, thus describes his own feelings while hypnotized : "I have not the smallest doubt, that at first I succeeded in abstracting myself, as it were, from surrounding circumstances. I had been reading very hard for days past on the subject of intestinal digestion in relation to the bacteria produced, and I pictured to myself the interior of the intestine and its contents ; then I tried to picture a special form of bacteria, and while I was engaged in contemplating its changes of form I seemed to lose all consciousness of persons around me." On a subsequent trial being made he looked at his boot, and thus described the process : "I ultimately succeeded in fixing my attention on six points of light reflected upon my boot, and having some minute resemblance in position to the constellation Orion. After looking fixedly at this for what seemed to me a very long time, the idea of the constellation vanished, and its place was taken by the outline of

the lower part of the face of a friend. All I could see was his beard and mouth and part of his nose and one cheek, the rest was cut off by a broad black area; the details were tolerably vivid."

The voluntary surrender of the will—the subject placing himself passively in the hands of the operator, is also an important factor in nearly all the processes. It is the initial step to the subsequent abandonment of the will of the subject to that of another. M. Richet, of the Salpêtriére, has shown that the subject may be surprised, and even rendered cataleptic, the moment his attention is in the least arrested. He is seized, and, as it were, instantaneously petrified, whatever efforts he makes to resist the influence. M. Richet constantly produces hypnotism by throwing a brilliant electric light upon the face of persons not expecting it, or by striking a gong which had been concealed. An hysterical or neurotic subject has been transformed into a statue by a blow or the concealed gong at the Salpêtriére.

2. *The Objective Symptoms of the Hypnotized.*—These vary with the stage or type. Charcot, Richet, Tamburini, and Sepelli recognize three fundamental types, the cataleptic, the lethargic, and the somnambulistic. In the first the limbs retain the positions in which they were placed, for a considerable time and without effort; in the second (the lethargic), the muscles which are relaxed are found to have the remarkable property of contracting in a most definite way under gentle mechanical application; in the third (the somnambulistic), the state of the subject answers much more to what is understood, as the so-called magnetic or mesmeric sleep. Contraction of the limbs can be produced, but they are of a different character from those in the cataleptic form, or the excitability of the muscles in the lethargic state.

Pupils.—The pupils exhibit strabismus and contraction, and afterwards are widely dilated and sluggish, an indication of the functional activity of the medulla, as regards the sympathetic as well as the respiratory centre.

Cerebral Circulation.—Ophthalmoscopic examination by Professor Förster of Heidenhain's patient showed that there was no contraction of the vessel as Heidenhain expected to find, as his theory had been that anæmia caused the sleep. That hyperæmia of the brain is not inconsistent with hypnotism was proved by hypnotizing a gentleman (Heidenhain's brother), who had inhaled nitrite of amyl. The respiration and pulsation are quickened at first. Professor Tam-

burini used the pneumograph, and he found the frequency of respiration to be doubled at first, and the inspiratory pause suppressed. These tracings are useful in detecting simulation. With the cataleptic subject the tracing is uniform in character from beginning to end. With the simulator, on the contrary, it is composed of two distinct parts. At the beginning, respiration is regular and normal; in the second stage, that which corresponds to the indications of muscular fatigue, irregularity in the rhythm occurs with deep and rapid depressions, manifest indications of the disturbance of the respiration caused by the effort to simulate. Professor Tamburini made careful pulse tracings also. The rise in the pulse is 100 per cent. The myograph, the pneumograph, and the sphygmograph are most valuable means, placed at our disposal by modern invention, for obtaining trustworthy records of the objective symptoms of hypnotism. There is heightened reflex action. The tendon reflexes may be normal or exaggerated. Richer states than in the lethargic type they are much exaggerated, in the cataleptic type they are diminished, and in the somnambulistic type normal. There is galvanic reaction.

3. *Subjective Symptoms described.*—Sensation of pain is deadened or suspended. Anæsthesia is produced. Mr. North said that a pin plunged into his hand nearly up to its head, felt as if a match or some blunt instrument were pressing against the hand. When he was roused it hurt him considerably to withdraw the pin. The special senses are interfered with or abolished. They may be either heightened or abolished in different cases. *Sight*, is partially affected. The subject sees, though confusedly, that which is immediately around him, but has a very vague or no perception at all of what is beyond this range. Some subjects describe a play of colors before the eyes. *Hearing* is not affected. *Taste* is suspended. There may be no unconsciousness whatever in some instances, and the subject may appear like other people. A certain susceptibility to impressions on the mental side and to rigidity of the limbs on the physical side may be all that marks the state of the subject. Is it that the cerebral cortex is just sufficiently weakened in function to have lost its supremacy, without parting with its more secondary offices?

Volition.—There is no spontaneity in hypnotized persons. Volition is suspended.

Extreme Susceptibility to Outside Suggestions.—The subject hypnotized is without any will-power, and at the mercy of any sugges-

tions however absurd. Hallucinations are easily induced. A person may eat heartily while hypnotized, and their visceral sensations will not suffice to inform them, so that they will wish for the next regular meal as if they had not eaten. Richet, of France, says: "The somnambulist has a perfect memory, a very lively intelligence, and an imagination which constructs the most complex hallucination." The great fact in mesmeric sleep is that will and consciousness are suspended, and the brain placed in the condition of the true spinal or reflex system. There is a reduction to a mere automatic condition. Heidenhain holds that the cause of the phenomena of hypnotism lies in the inhibition of the activity of the ganglion cells of the cerebral cortex by prolonged stimulation of the sensory nerves of the face, or the auditory or optic nerve. A sensory nerve may certainly inhibit the brain centres, and this inhibition is the starting-point of hypnotism.

Conclusions.—1. There may be consciousness during the state of hypnotism, and it may pass rapidly or slowly into complete unconsciousness as in the somnambulistic state; the manifestations not being dependent upon the presence or absence of consciousness, which is merely an epiphenomenon.

2. Voluntary control over thought and action is suspended.

3. The reflex action, therefore, of the cerebral cortex to suggestions from without, so long as any channel of communication is open, comes in play.

4. While the consciousness is retained, the perception of the reflex or automatic cerebral action conveys the impression that there are two egos.

5. Some of the mental functions, as memory, may be exalted, and there may be vivid hallucinations and delusions.

6. Unconscious reflex mimicry may be the only mental phenomena present, the subject copying minutely everything said or done by the person with whom he is *en rapport.*

7. Impressions from without may be blocked at different points in the encephalon, according to the areas affected and the completeness with which they are hypnotized; thus, an impression or suggestion may take the round of the basal ganglia only, or may pass to the cortex, and, having reached the cortex, may excite ideation and reflex muscular actions, with or without consciousness, and wholly independent of the will.

8. There may be in different states of hypnotism exaltation or de-

pression of sensation, and the special senses. There is a peculiar abnormal mental condition presented in hypnotism, closely allied to mental disease, and full of interest to students of mental science. The subject has been scientifically studied by James Braid, of Manchester, in 1843; Esdaile, in India, in 1846; Girard Teulon and Demarquay, in 1860; Richet, in 1875; Charcot, in 1878; and, in or about 1880, by the late Dr. George M. Beard, Drs. Weinhold, Preyer, Berger, Grützner, and Heidenhain, and Dr. H. Charleton Bastian. We may fail at first with a subject, and after a few trials he may make an excellent subject for experimentation. Bastian says that persons, who have been once hypnotized, can in general be again brought with comparative ease into the same condition, and the facility of hypnotizing such persons goes on increasing after each operation, owing to the existence of a predisposing mental state. A condition of excited expectancy is a decidedly favoring mental state.

The simplest condition necessary to induce the hypnotic or trance-like condition is to make the subject look fixedly for a few seconds at a bright object, held by the operator at about eight to fifteen inches above the eyes, at such a distance above the forehead as may be necessary to produce the greatest possible strain upon the eyes and eyelids, and enable the patient to maintain a steady, fixed stare at the object. We must tell the subject to keep his eyes steadily fixed on this object and his mind riveted upon the image of it. In some persons, after fifteen or twenty seconds, we shall find a decided cataleptic state induced, so that the limbs have the tendency to remain in the position in which we place them, and, if not, we may gently request the patient to keep his limbs in the position in which we have placed them. The pulse now quickens and the limbs shortly become rigid. By prolonging this process we induce a profound sleep, or trance, in which there is complete anæsthesia. Esdaile, in India, performed numerous operations on Hindoos with absence of all pain while hypnotized. The therapeutic value of hypnotism has never yet been thoroughly tested, and the future may develop facts of much interest and value.

CHAPTER XXVI.

CEREBRAL AND SPINAL ANÆMIA.

The occurrence of cerebral and spinal anæmia is becoming so frequent among American women and is the cause of so much of their ill health and lassitude, that I propose to investigate in this chapter its symptoms, causes, morbid anatomy, and treatment, feeling sure that so common and troublesome an affection cannot fail to be of interest to the majority of the profession.

We are applied to for treatment by pale, colorless women, with cold skin, complaining of headache of a limited nature, usually relieved by lying down, and exaggerated by either physical or mental effort. These patients have little muscular power; and we sometimes find symptoms of anæsthesia. The patients all complain of drowsiness. The majority of these patients will be found, when spinal anæmia is present, to have tenderness over one or more points of the vertebral column, which is increased by pressure. The pain developed by such pressure may be either dull or sharp in nature. We may, in rare cases, find tenderness, on pressure, over the entire spine. Neuralgia is also a very prominent symptom, and may be experienced in the head, face, neck, shoulders, and upper extremities when the cervical and dorsal regions of the spinal cord are implicated; while the neuralgic pain attacks the pelvis and the lower extremities when the anæmia implicates the lumbar region of the spine. If the neuralgic pain is in the head, it may vary in its location, being sometimes in one part of the head or face and sometimes in another, and sometimes on one side only. In the head, it may be limited to a small spot. This pain is relieved by lying down and keeping perfectly still. It may be very continuous and exasperating, and may be accompanied by nausea and vomiting. The extremities are very apt to be cold, and sleep is restless and disturbed. These patients look very worn and thin. These patients may have prolonged muscular contractions, especially of the lower limbs and of the hands. I have at present a lady from Mississippi under my care who suffers from spinal anæmia and hysteria, and who, before leaving her home in Mississippi, had been for a week in a cataleptic state, whose fingers and thumbs are tightly closed upon the palms, and have been so for some months. This contraction is with her, as it is with all cases,

painless. It came on suddenly, and I have confidently predicted that when the spinal anæmia is cured it will cease as suddenly as it came on. This young lady was suffering from complete hysterical paralysis when she entered my hospital, and had not spoken for a long time. The muscles were attenuated by disuse, her expression was idiotic, and she could not walk a step and would not utter a sound. Under the constant galvanic current, the negative pole to the sixth cervical vertebra and the positive pole to the coccyx, the ascending current from thirty-two cells being used; hypodermics of strychnia; the actual cautery to the neck twice; a full diet, blisters to the spine, and tonics; she now walks well; her muscles have regained their tone; she reads well; can write a little, although she holds a pen very clumsily, owing to the contraction, and is making an excellent recovery. Respecting this patient's obstinate silence, I received the following from her family physician, under date of August 7th, 1882:

DEAR DOCTOR,—Your favor of the 25th inst. reached me seven days ago, but urgent professional engagements have interfered with my answering it sooner. Miss ——'s silence, to which you refer, and ask if she has "ever had any dominant idea or emotion" which would account for it, has been for years a marked peculiarity, and, as far as I know, has been a *habit* with her among strangers. I am not aware of any depressing "emotion or idea" which might explain it, or of any taint of insanity in her family. In a general way, I am inclined to fall back on the idea of family taint to explain her peculiarities. I think those who have known best would say that she is a "girl of peculiar mental constitution, even when well," as you suggest, etc., etc.

It is evident, from this letter, that my patient was one of those individuals who had inherited a marked nervous constitution. Another similar case from Missouri had prolonged muscular contractions of the lower limbs. She had marked spinal anæmia. The contractions suddenly disappeared as she got better, she made an excellent recovery.

At times we find hyperæsthesia existing, either of the whole or of a part of the body, or limited, in some cases, to the organs of special sense. Occasionally we see convulsive movements, and also affections of the larynx and air-passages, and alimentary canal. Some patients with cerebral anæmia give a history of attacks of dizziness and fainting fits, while others complain of intense irritability and disturbances of sensibility. These latter patients are very sensitive to light and sound, and have flashes before the eyes. There may be delirium, convulsions, and coma, and even attacks of acute mania, in the worst cases of cerebral anæmia. Patients are very apathetic,

and they have much mental lassitude. They are inclined, as I have said, to sleep, but their sleep is of a disturbed character, and they are annoyed by frightful dreams. In nearly every case of cerebral anæmia, we meet with disturbances of the mind ranging from slight hysterical symptoms to acute maniacal paroxysms. We also find disturbances of the digestive organs, of the genito-urinary organs, and of the heart and circulation. Also, we find in cerebral anæmia that many visceral diseases are simulated by this affection.

The neuralgia, before alluded to, has the peculiarity of shifting its seat quite suddenly from one place to another, and this is one of the principal diagnostic features of spinal anæmia. These neuralgic pains are increased by physical or mental effort, and relieved by lying down, when the contracted and bloodless cerebral and spinal vessels become filled with blood. As a rule, we do not find that our patients complain of pain in the spine. We more generally find that a sense of weight and heat in the spine is due to spinal congestion, and not to anæmia. We often have complaints, as I have said, of nausea and vomiting. We sometimes find weakness, but no true paralysis. The affections of various parts of the body and the viscera, in cerebral and spinal anæmia, are due probably to the fact of the sympathetic system of nerves being affected. This system of nerves, as it is well known, is closely interwoven with the spinal system, each spinal nerve receiving branches from, and transmitting branches to, a neighboring sympathetic ganglion. The sympathetic system of nerves regulates the shortening and lengthening of all organic muscular fibres; it controls the contraction and dilatation of the bloodvessels, and consequently the amount of blood supplied to different parts, and the rapidity of its flow through them, and in this way, in a certain degree, it regulates the nutrition and functional activity of the organs and their temperature. It is also probable that the sympathetic system exerts a direct influence over the glandular organs of the body. This affords a rational explanation of nutritive and functional difficulties occurring in the course of cerebral and spinal anæmia,—functions of different parts and organs being impaired, exalted, or perverted.

Spinal anæmia is a disease of capillary contraction and bloodlessness of the spine. It is a functional disease, and there are, so far as present knowledge exists, no morbid structural changes. In making a diagnosis between anæmia and other morbid states of the spinal cord, such as spinal meningitis and spinal congestion, we must bear in mind

that in the latter diseases the spine is not tender on pressure. If there is disease of the vertebræ, we have spinal tenderness; but such disease is usually found under the age of fifteen or twenty years. Again, if there should chance, in spinal anæmia, to be an apparent projection of the tender vertebræ, which would lead us to suspect caries of the vertebræ, we shall find that it is *not* a real projection, displacement, or curvature, but merely a *simulation*, depending on puffing out of the ligaments and investments of the spine. If there were diseased vertebræ, we should find paralysis of the lower limbs in all probability, while we almost never find this in spinal anæmia. Another diagnostic point of importance is the fact that spinal anæmia is relieved by lying down, while in spinal congestion, meningitis, and myelitis, the symptoms are all worse after a night's sleep. It has also been claimed that hypodermic injections of strychnia will relieve spinal anæmia, while they intensify the symptoms of congestion, meningitis, and myelitis. As I have before remarked, the prolonged muscular contractions in anæmia are painless, while in myelitis they are accompanied with great suffering.

Cerebral anæmia is a decrease in the amount of blood circulating through the brain in a given space of time, the dilating and contracting power of the bloodvessels altering their calibre, and thus permitting a diminution in the flow of blood. During sleep, there is a period of temporary quiescence of the brain, during which time it is pale and bloodless. Alterations in the vascularity of the brain are due partly to the presence of the cerebro-spinal fluid, the brain becoming more vascular as the amount of the fluid is diminished, and as the vascularity decreases, the bulk of the fluid increases. As I have stated elsewhere, the amount of blood going to the brain is a fifth of the whole bulk of the blood; a reduction, therefore, in the usual supply of blood will soon become apparent in the cerebral circulation. As an illustration of this, may be mentioned constant drains on the system, such as morbid growths, imperfect nutrition, and dyspepsia.

Spanæmia is a cause of cerebral anæmia, arising, as it does, from malarial poisoning, lithiasis, and prolonged administration of certain drugs. Cerebral anæmia may be produced by unfilled vessels, heart disease, organic disease of the cerebral vessels, venous stasis, apoplexy, and vaso-motor disturbances of the cerebral vessels. The principal causes of anæmia of the brain are, as I have remarked above, those that diminish the entire amount of blood in the brain, such as hæmor-

rhage, exudation, and fevers; the congestion of the other organs of the body; the compression or obstruction of arteries supplying the brain, mental excitement, which causes innervation or spasmodic contraction of arteries; diminution of the space in the skull by exudations, extravasations, or tumors; and leucocythæmia.

The causes of spinal anæmia may arise from congenital predisposition, and include everything which tends to induce a nervous temperament, and all things that tend to exhaust vital power. Cerebral anæmia may come on quite suddenly and severely, or it may come on slowly and be less severe. In cases of the former description, patients are attacked with sudden dizziness, become insensible to impressions, and cannot move. They faint away, with slight spasmodic movements. When the cerebral anæmia comes on slowly, we find symptoms of irritation and, subsequently, paralysis. When the anæmia does not attain a high grade, only the symptoms of cerebral irritation are noticeable. Sometimes there are great disturbances of sensibility. Such patients complain of much headache in the forehead or occiput, and sensitiveness to light and sound, so that even daylight admitted into the room causes them great discomfort, and slight sounds are insupportable. These patients have flashes before their eyes, noises in the ears, and vertigo. We see this in women with metrorrhagia and other losses of blood. In the case of cerebral anæmia in children, we find that motor disturbances are most noticeable.

At times, the symptoms of cerebral anæmia may be almost wholly confined to the mental functions. The mental action in cerebral anæmia, when disturbed, is quick, irritable, and tending to convulsive irregularities. The state of anæmia, if carried beyond a certain point, will destroy functional excitability and the activity of the brain. In cerebral anæmia, when the mental functions are affected, we see a pale face, cool head, and weak pulse, the cerebral organs being in a state of irritable weakness, easily excited by action, the action, however, being powerless and irregular. Some of the most violent maniacal attacks I have ever seen were in cases of insanity, when the pathological state was one of anæmia of the brain. Examination of the heart in these cases reveals systolic and diastolic bellows-murmurs, heard most plainly at the base of the heart, and also venous murmurs.

Prognosis.—The prognosis in cerebral anæmia and spinal anæmia is generally good, if no organic disease exists; but if anæmia of the

brain depends on diseased vessels, or organic disease of the heart, the prognosis is bad. Cerebral anæmia, if not checked, passes on to melancholia and dementia, ending in psychical torpidity and intellectual decay. The dementia resulting from cerebral anæmia begins in one of two ways, either gradually, and at first by imperceptible encroachments, or by maniacal excitement. Its acme is a mental state of profound stupidity. In cases of dementia, the amount of cerebral atrophy which ensues may be calculated upon by the enfeeblement of mental power. We certainly have some atrophy, and this amount will generally be found to correspond with the degree of mental decadence present.

Treatment.—The treatment must be psychical and physical. With regard to the first, as soon as the system is somewhat improved, change of scene, travelling, and cheerful society are to be recommended, while the physical or medicinal treatment consists in primarily toning up the system, and improving both the quantity and quality of blood circulating in the brain and spinal cord. If our patients are much debilitated, we must keep them in a recumbent position, and obtain *rest* for body and mind. All emotional disturbances must be carefully removed. Iron, in combination with the chloro-phosphide of arsenic (Routh's formula), 5 minims ter die, may be given, and alcohol must be freely administered. Old rye whiskey is the most eligible form in which to give alcohol. The constant galvanic current is a valuable remedy, the ascending current from sixteen to thirty cells being used, the negative electrode being placed at the base of the brain, while the positive is placed at the coccyx. Strychnia, in $\frac{1}{32}$-grain doses, is one of our most valuable medicines, and it may with advantage be combined with iron and quinine. I have found a very eligible and pleasant preparation to be the elixir of the phosphate of iron, with quinine and strychnia, made by Wm. Neergaard of New York. Each teaspoonful contains 2 grains of the phosphate of iron, 1 grain of quinine, and $\frac{1}{60}$ grain of strychnia. Practitioners can easily combine formulas to suit themselves. To lay down a general plan of treatment for cerebral anæmia would include the administration of stimulants, tonics, and plenty of milk, eggs, and beef. Cod-liver oil with phosphorus is indicated. In cases of spinal anæmia and irritation, the first great means of cure resides in the judicious employment of counter-irritation to the affected portion of the spine; and I have found the compound mustard liniment, made up with fresh oil of mustard, so that the liniment possesses a

strong pungent odor, applied on flannel or cotton-batting to the affected region of the spine, and the whole covered with oil silk, the most efficacious method of counter-irritation, and have obtained excellent results from its use. Blistering the spine and the actual cautery are both very useful at times when indicated. Besides putting patients suffering from spinal anæmia on a full nourishing diet, I am in the habit of prescribing stimulants in liberal doses. In using the constant current of electricity to the spine, I apply the current twice a day for a few minutes at each sitting. Phosphorus is best administered in the shape of phosphide of zinc, I think, as the combination is very stable, and the phosphorus does not become oxidized as in other preparations. $\frac{1}{10}$ to $\frac{1}{5}$ of a grain in pill form is my usual dose, which contains $\frac{1}{100}$ to $\frac{1}{50}$ of a grain of phosphorus. Thompson's solution of phosphorus, and phosphorus administered in cod-liver oil, are both eligible. From $\frac{1}{25}$ to $\frac{1}{50}$ of a grain of phosphorus, thrice daily, is my usual dose. The cod-liver oil acts on the nutrition of the central nervous system, which it tends to preserve in its organic integrity, while the phosphorus is nerve food and builds up the exhausted nervous system, having a special stimulating power. A combination of strychnia, quinia, and tincture ferri muriat., with glycerine as a menstruum, has given me good results. By judicious treatment, and the removal of all causes calculated to keep up cerebral and spinal anæmia, we shall get the most gratifying results; our patient will improve in personal appearance and weight, the spinal tenderness and the attendant neuralgic pains will disappear, the mental irritability and pain in the head will be a thing of the past, all the symptoms will decrease in intensity and finally disappear, and a permanent cure will be obtained, to the satisfaction alike of the physician and of the patient.

CHAPTER XXVII.

INFLAMMATORY DISEASES OF THE BRAIN AND ITS MEMBRANES.

The periphery of the brain is very sensitive, and injuries or diseases of this portion are attended with very serious results. Inflammations of the membranes of the brain, especially of the arachnoid and pia mater, are consequently very fatal. These inflammations of

the membranes of the brain are followed by the formation of pus, or the effusion of serum or of lymph.

The diagnosis during life is exceedingly difficult between inflammations of the substance of the brain, cerebritis or encephalitis, and that of the membranes, meningitis. Idiopathic cerebritis is, however, an exceedingly rare disease, and, with the exception of cases of idiopathic cerebritis, caused in the tropics by exposure to the sun; cerebritis from severe injuries, such as concussion of the brain; cerebritis from cranial bone disease, and that resulting from the overwhelming effect of alcohol, of which I have seen a few, we rarely meet with cases of cerebritis at all, except as secondary to inflammation of the membranes.* The effusions of pus, serum, or lymph *in* meningitis, pressing in the brain-substance, produce the gravest symptoms, and are fatal, unless relieved by medical or surgical means. Although we very rarely see the dura mater affected by inflammation, as an idiopathic disease, it may readily become so as a result of injuries to the scalp, owing, I suppose, to an extension, by sympathy, of inflammation of the pericranium, which is the *external* periosteum to the dura mater, which is really the *internal* periosteum of the skull, lying, as it does, between the bony cranium and the arachnoid membrane. The anatomical structure of these membranes is the same, and there is a very close relation existing between them, as a vascular communication exists between them through the medium of the cranium. We find, therefore, that injuries that affect the external covering of the skull are often followed by inflammation of the dura mater. Thus a comparatively slight scalp wound may be followed by the most serious consequences, perhaps of a fatal nature. I regard, therefore, all cases of external injury to the head as of great importance when we bear in mind the above anatomical relationship between the pericranium and the dura mater. The early symptoms are not readily recognizable, but those of the resulting effusion are those indicating compression of the brain, the patient becoming

* Dr. Jonathan Hutchinson, of England, says it may perhaps be doubted whether the occurrence of diffuse inflammation of the brain substance as an acute disease has as yet been proved, excepting as a result of wounds. Even as a traumatic lesion, he says, its special features have by no means been accurately studied. It is, however, highly probable that after penetrating wounds of the brain, its substance may inflame, just as the cellular tissue of a limb may, the inflammatory processes beginning at the site of the wound and rapidly spreading through a large part of the hemisphere. It is probably in the perivascular spaces that the process chiefly spreads, and it is in these that the microscope will detect the most abundant results.

stupid, sleepy, and lethargic, passing into a state of coma, from which he can be roused with difficulty, or not at all. The breathing is heavy and stertorous; the pupils contracted or dilated; the pulse is full and strong and slow; the bowels act involuntarily; and retention of urine is often found. If after even a slight injury to the head our patient becomes dull, sleepy, and comatose, and the other symptoms I have spoken of, we should suspect effusion on the surface of the dura mater, we should apply cold to the head, open the bowels by croton oil dropped on the tongue, keep the patient perfectly at rest, and exclude light from his room. The trephine offers us, however, the only means of relieving the compression, although it is extremely difficult to determine with accuracy the exact seat of the effusion.

In inflammations of the arachnoid and pia mater, which are so intimately united together that inflammation in one necessarily affects the other, the effusion of pus is rare, and the effusion of serum very common, varying in amount from an ounce to two or three pints. The effusion of lymph is usually found at the base of the brain, about the commissure of the optic nerves, the pons varolii, and the medulla oblongata, and we may also find it in large quantities over the surface of the brain, and running along the course of the fissure of Sylvius.

We have, in meningitis, the stage of invasion and the stage of effusion, but, as I have said, the first stage is not easy of diagnosis, as the symptoms are often obscure.

In a typical case we have rigors, pain in the head, intolerance of light and noise, and irritability of temper. In a child, the attack may begin with a violent scream or cry, and the head is tossed around in every direction. The heat of the head is increased, and the temperature considerably increased. The skin is hot and dry and the pulse quick and strong. The urine is scanty and high-colored, and the bowels either constipated, or, if open, the stools are pale in color and offensive. The two most marked symptoms, and those on which I would lay special stress, are the existence of contracted pupils and vomiting. If these two symptoms co-exist, the diagnosis is certain when the other symptoms I have enumerated are present. These are the symptoms of the first stage of meningitis. In the secondary stage, or stage of effusion, our patient falls into a comatose and lethargic condition, with a full, slow pulse, and dilated pupils—the latter symptom indicative of effusion. We may have squinting, convulsions, rigidity of one extremity, perhaps, involuntary discharge of fæces and urine, jactitation, and finally death. Sometimes, in spite

of the most desperate symptoms, we shall get a cure, if we treat our patient skilfully, and with due regard to his diathesis.

We must direct our treatment to the constitutional taint. Thus, if we are treating a rheumatic patient, we should give him colchicum and salicylic acid. If he is scrofulous, we should give him cod-liver oil and iron, and if syphilitic, the iodide of sodium or potassium and mercury. In other cases, antiphlogistic treatment, calomel in repeated doses with saline purgatives, and early bloodletting, if it is decided to bleed at all, *at the very outset of the symptoms.*

In children, we may put leeches on the temples and a bladder of ice on the head, open the bowels by salines, and give calomel in repeated doses, which will result, I think, in positive benefit. In the stage of effusion, with dilated pupils and coma, although the patient will probably die, we may blister the back of the neck to promote absorption of the effused fluids, calomel in grain-doses for some time, and the iodide of sodium or potassium five-grain doses three times a day, and we may possibly save our patient.

Typhoid fever, as it is well known, presents very often at its outset the most marked cerebral symptoms, and is liable, perhaps, in some cases, to be mistaken for inflammation of the substance of the brain, or cerebritis. We may be called to see patients who may present most of the symptoms belonging to inflammation of the brain, namely, hot head, violent delirium, hot skin, full and rapid pulse, great thirst, and furred tongue, but, on very careful examination of the body, we may detect one or two of the characteristic rose spots which will enable us to pronounce the case one of typhoid fever, and to give a favorable prognosis. It is often very difficult to detect typhoid fever, for the rose rash is apt, I think, to be very scanty, perhaps limited to one or two spots, and these attacks are likely to prove the most severe. I perhaps have spoken too hastily when I say we can give a favorable prognosis in these cases, for the presence, as I have just said, of a very few rose spots indicates an attack of great severity, and death sometimes rapidly ensues in these attacks.

Respecting delirium tremens, we must diagnose between this disease of debility and inflammation of the brain. The head in delirium tremens, instead of being hot and dry, is cool and moist, and the skin bathed in perspiration. The delirium, instead of being furious, is low and suspicious; the tongue, instead of being dry, is coated with a moist, creamy fur, and, if death ensues, there is very likely nothing

visible in the inter-cranial structures. While we treat an inflammation of the brain by ice to the head, leeches, by low diet, calomel, and purgatives, we, on the other hand, treat delirium tremens by an entirely different plan—by nourishment, perhaps by stimulants, sedatives, and careful watching and nursing.

In acute mania, the inflammatory symptoms of cerebritis are wanting, and the existence of a furious delirium is the only thing in common in the two diseases. In the inflammation of the brain, or cerebritis attending concussion of the brain, in which the whole brain is very much shaken, capillary congestion takes places, and the inflammatory process passes on to its destructive stages. In these cases, about forty-eight hours after the receipt of the injury, vomiting occurs, severe pain in the head, the pupils are contracted, the scalp is hot, there is intolerance of light and noise, the pulse is full, hard, and strong, and we have a violent delirium.

In inflammation of the brain from disease of the cranial bones, of which I have spoken, we find a young person, probably of a strumous diathesis, who very likely has had, for a long time, a discharge from the ear, suddenly seized with a pain in the head, vomiting, delirium, contracted pupils, hot skin, loaded tongue, and the other symptoms of cerebritis, and this is a very fatal form of the disease. The treatment of these latter cases is very unsatisfactory, but where there is a discharge from the ear, we should encourage the discharge, apply blisters behind the ear, and employ a mild antiphlogistic plan of treatment.

When the cerebritis is the result of the immediate effects of alcohol, if our patient has a hot head, furious delirium, bloodshot eyes, we are, I think, in some cases, perfectly justified in abstracting blood, but *never* where, as in delirium tremens, which is *not* an inflammatory disease, our patient is broken down by previous excesses. Ice to the head, and saline aperients and tranquillizing measures are also necessary in these cases.

CHAPTER XXVIII.

NEURALGIA.

I THINK the nervous pain, resulting from a morbid exaltation of sensibility, which is to-day affecting so many people, and particularly so many American women, is, perhaps, in its treatment, and sometimes, also, in its diagnosis, very troublesome to the general practitioner. These nervous pains may simulate very serious organic trouble, and I have been consulted by more than one able physician, who thought that he was suffering from organic brain, or spinal cord disease, when really a nervous prostration had been the cause merely of an inveterate neuralgia of great intensity, and where rest, change of scene, nervines and the constant current of electricity accomplished a speedy cure. In neuralgia, sensibility is both perverted and exalted. There is no inflammation, no fever, but the severity of the pain may be intense. The irritation causing neuralgia may be located in the brain, in the spinal cord, or in the trunk of the nerve that supplies the affected part, *i. e.*, in the sentient extremity of a nerve-trunk. An aneurism of the femoral artery has given rise to excruciating pain in the knee, and I have seen numerous instances since the late war, where musket-ball wounds have healed nicely, but have left very severe neuralgia in the extremities. In neuralgia of the extremities, therefore, we should search for trouble or injury to the trunk of the nerve, whose sentient extremities are affected, and, if we then find no source of irritation, we may suspect the spinal cord or brain as the seat of irritation. The violent pains of neuralgia are situated either in the trunk or branch of a nerve, and occur in paroxysms of irregular duration, and at either regular or irregular intervals. Among the most intense neuralgias may be mentioned tic douloureux or facial neuralgia, affecting the facial branches of the fifth pair of nerves. In this form of neuralgia, the patient will writhe with the agonizing pain in the side of the face, beginning near the eye or ear, the pain being of an acute, stabbing, lacerating character, and darting like an electric shock into the upper and lower jaw, lips, eye, forehead, and scalp, and a strong light, a loud noise, a draught of air, or a mental emotion—all tend to aggravate this most intolerable disorder. We have to soothe the over-excited, central, nervous apparatus, and examine for impairment of the digestive, assimilating and excreting

functions. There are no structural changes to be found in the trifacial nerve or its ramifications, the ophthalmic, superior maxillary, or inferior maxillary branches of the fifth pair of nerves. The infra-orbital branch is the one I have generally found to be the oftenest affected as it passes from the foramen, the pain starting and radiating from this point on the cheek of the patient. All the cranial nerves may be, and are, peculiarly susceptible to neuralgia: the olfactory nerves, the exit of which is the cribriform plate; the optic nerves, the exit of which is the optic foramen; the motor oculi, the exit of which is the foramen lacerum anterior; the trochlearis, having the same exit; the ophthalmic branch of the fifth pair of nerves, having the same exit; the superior maxillary branch of the fifth pair, the exit of which is the foramen rotundum; the inferior maxillary branch of the fifth pair, the exit of which is the foramen ovale; the sixth pair—abducens—of which the exit is the foramen lacerum anterior; the seventh pair—facial nerves—the exit of which is the meatus auditorium internum; the eighth pair—auditory nerves—the exit of which is the same as the seventh pair; the ninth pair, glosso-pharangeal, the exit of which is the foramen lacerum post; the pneumogastric, or par vagum, the exit of which is the same, as also it is of the eleventh pair of cranial nerves, the spinal accessory; and, lastly, the hypoglossal nerves, or twelfth pair, the exit of which is the anterior condyloid foramen. The neuralgic pain varies in character, is always excessive, and returns at irregular periods. It may be related to functional disturbance or irritation of the Gasserian ganglion, which we must *soothe* by Duquesnel's aconitia in $\frac{1}{200}$-grain doses, and *feed* by cod-liver oil in small doses, as the nerve-cells of the whole central nervous system have to be fed in neuralgias. We should bear in mind that if we find redness, heat, or swelling of an affected part, we have to deal with a *neuritis*, not a *neuralgia*. Thus the pressure of a gravid uterus, in a patient recently under my care, produced a pressure on the pelvic nerves, principally in the sciatic, occasioning acute lancinating pain and partial paralysis. It was a case of puerperal neuritis, of extreme intensity, and the first severe case I had ever met with. There was a fixed pain, tension, swelling, and tenderness on pressure, and the pain increased when the muscles supplied by the sciatic were contracted. In the neuromata, or nerve-tumors, we may find a chronic neuritis. These tumors are formed on nerve-trunks, or branches, and vary in size from the size of a pea to that of an egg, and these tumors may be multiple. They are hard

and firm to the touch, very painful on pressure, and the pain extends to the peripheral terminations of the affected nerve. These cases may be treated by small blisters in the affected course of the nerve, by anodyne fomentations, and by the constant current of electricity, and internally by anodynes and alteratives.

Extirpation of the tumor becomes advisable in a certain class of cases. If in the neuralgias other treatment fails, and our patient has a furred tongue and loaded bowels, and no appetite, an alkaline course of treatment and purgatives may sometimes accomplish a cure, and we must treat the diathesis of the patient. Among the neuralgias may be enumerated gastrodynia, angina pectoris, neuralgia of the kidneys or nephralgia, hemicrania, sciatica, visceral neuralgias, and intercostal neuralgia. I have recently seen rather an unusual case of intercostal neuralgia, in a lady about fifty years of age, in whom I found both disordered digestion and very marked spinal irritation. The pain, which was located in the ninth intercostal space, was increased by a full inspiration and by coughing. It also extended to the spine and was sharp and darting. This lady had suffered from repeated attacks of great severity, which had uniformly been treated with opium and without success. I found this patient's tongue heavily coated, a foul breath and constipated bowels, and very marked tenderness on pressure in the dorsal region of the spine. I accordingly suggested a plan of treatment consisting of rhubarb and soda, made palatable by the addition of cinnamon and sugar; also the application to the tender spots in the spine of the compound mustard liniment, made up with the freshly prepared oil of mustard, to be applied on a small folded piece of absorbent lint, to be covered with oiled silk, and this to be repeated every night; also cod-liver oil in teaspoonful doses, and a tonic mixture containing strychnia in $\frac{1}{32}$-grain doses; also electricity in the form of central galvanization. I am informed that this plan of treatment resulted in a rapid cure. Phosphorus and cod-liver oil, in such cases, together with electricity, should be employed for months to restore the impaired nutrition of the central nervous system. In sciatica, which is most frequent in wet and stormy weather, we find intense pain in the course of the sciatic nerve, generally downward along the posterior surface of the thigh to the popliteal space, and very frequently extending down the tibial nerve. It is generally worse at night, and there are remissions more or less complete in character. We may have partial paralysis of a limb, with emaciation, and also dragging of a limb. In addition to

correcting any disordered state of the digestive organs, and building up the general health, we may employ a series of small fly blisters, use deep hypodermics of morphia and atropia, apply ice on the affected part or a cold douche over the hip and leg, a solution locally of cyanide of potassium, ℥j to ℥vi of water, applied by friction on the course of the nerve, or, finally, the constant current of electricity. The hypodermic injection of atropia in *one* injection of $\frac{1}{15}$ of a grain, which will cause some delirium, has cured entirely some cases that had resisted all other treatment. In lumbago, allied to neuralgia, the inhalation of ether will afford great relief. In the visceral neuralgias, especially of the uterus and ovaries, the hypodermic use of atropia is decidedly the most efficacious mode of treatment at our command, using from $\frac{1}{120}$ to $\frac{1}{60}$ of a grain according to circumstances. Also the constant current of electricity locally over the hypogastric region, or locally as the circumstances of the case may dictate. In neuralgia of the stomach there is nothing at all comparable to a combination of bismuth, carbonate of iron and morphia in powder, administered three times a day. In angina pectoris the nitrate of amyl, or nitro-glycerine pills, are indicated. In hemicrania, a neuralgic headache of one side of the head, when periodical, as it often is, a course of Fowler's solution, with laxatives, will accomplish a cure, as will also quinine, in many instances, when malaria is the cause, as very frequently is the case. In cases where hemicrania is not strictly periodical, I regard as by far the most valuable remedy cannabis indica in full doses. In the forms of visceral neuralgia, met with in hypochondriacal or hysterical cases, we must combat the asthenic condition usually existing by iron, quinine, and strychnia, or arsenic, and quiet the morbid exalted sensibility by a course of warm baths; a course of electricity is also of value in these cases.*

The *pathology* of neuralgia consists in the functional impairment of the sensory nerve-cells of the central sensory tract of the nervous system, which is the seat of nervous sensibility, which functional disease consists of a worn, irritable, and hypersensitive condition, as Professor J. S. Jewell has ably demonstrated. The nutrition of the cortex of the brain is at fault, and there is often an anæmic state of the brain and cord to be combated. Neuralgic pain may doubtless, in some instances, be dependent upon peripheral vaso-motor disturbance, but the *nerve-centres* are generally the seat of the disease, and the lesion a lesion of nutrition. I regard the most important pre-

* The galvanic current and static electricity are here indicated.

disposing cause of neuralgia to be neurasthenia, or nervous exhaustion, which, by impairing and lowering vitality, inducing an irritable state of the brain, causing sleeplessness and getting up a general asthenic state of the whole system, predisposes directly to neuralgia, by inducing the very lesions of nutrition in the brain, which I have just been speaking of. We find, as the result of excessive mental labor, anxiety, depressing mental emotions, hæmorrhages, and sleeplessness, a state of things which, in women, is associated with uterine displacements and spinal irritation, and, in men, by irritability, mental depression, and impending mental disorder. Malaria may also develop an extensive state of nervous exhaustion, exhibiting almost an incredible number of nervous phenomena. Professor Austin Flint, in his able writings on the periodical fevers, has very correctly, according to my experience in nervous diseases, pointed out that paroxysms of neuralgia will at times seem to take the place of the paroxysms of intermittent fever, recurring with the same regularity after intervals corresponding to those in the different types of intermittent fever, and a cure is effected by quinia or arsenic, which destroys the morbific agent, the cryptogamic vegetable organisms, which causes the malaria. For the general nervousness resulting from malaria, there is no known remedy comparable to arsenic. Too early educational pressure also operates in the production, as the child grows up, of exhaustive nervous neuralgia. The loss of nerve-tone in neurasthenia, or nerve exhaustion, affects the kidneys, and we often get obscure attacks of drowsiness as the result of deranged functional action of the kidneys and great excess of urea. As a result of nervous exhaustion, cerebral hyperæmia and anæmia may follow with their symptoms ; profuse perspirations also accompany marked nervous exhaustion, and the natural elasticity of the skin is lost. These cases of nervous exhaustion, or neurasthenia, furnish a great many cases of neuralgia, as a result of the impaired nutrition, and therefore I have classed neurasthenia, or nerve exhaustion, as the first great predisposing cause. There is one point of great importance to be spoken of here, and that is, that the tendency of neurasthenia is toward incipient insanity, and that if the physician notices in his patient, suffering from nervous exhaustion, mental depression and insomnia, and wishes to prevent active insanity taking the form of melancholia or mania, he must *at once* prohibit any further mental work, and prescribe a change of air and scene for his patient, taking him altogether away from business cares and anxieties for *at least*

one month. Constant change of scene, as in travel, *tires* and exhausts rather than rests our patient with nervous exhaustion, and rest and nutrition are the two cardinal points in treatment, with quinine and arsenic as nerve-tonics, together with a course of electricity. The motor phenomena in these cases consist in a loss of muscular power and endurance. The circulation is also affected by exaltation of vaso-motor reflex excitability, so that palpitations occur, as the result of disturbed action of the heart. The vaso constrictors and the vaso-dilators, the two kinds of nerve-fibres connecting the peripheral vaso-motor mechanisms with the spinal cord and medulla, are also affected in a reflex way in nervous asthenia, causing circulatory disturbances, varying in extent and degree. The disturbances in secretions, to which I have alluded, are evidence of disturbance of the secreto-motor part of the nervous apparatus. There is inability to sustain prolonged mental effort, and the memory is defective. This is all indicative of brain-fatigue or brain-waste, and in these states the chloro-phosphide of arsenic will give good results if used for some weeks judiciously. I prefer beginning with 5 minims of the chloro-phosphide (Routh's formula) thrice daily after meals, and gradually decrease it until 2 minims are taken thrice daily, and order this continued for some time, and finally drop the arsenic altogether. At the end of about six weeks of arsenical treatment, the patient experiences a general sense of well-being, the elasticity of the skin returns, and the physical and mental tone returns.

These cases all give the same history of being unable to do or endure, either mentally or physically, what they did in health; and also that they are much more easily affected than when in health. They will also, very often complain of irregular action of the heart; and a general diminution of vascular tonus makes them complain of vertigo, dimness of vision, and even syncope, from a change of position, such as getting out of bed to a standing position. We may also see, in asthenic cases, certain morbid psychical symptoms, *distrust* being one of the most prominent, and perhaps even gravest psychical symptoms. I have been thus explicit in my remarks on nervous exhaustion because very often, to cure neuralgia, you must first remove this influential predisposing cause. It was Romberg, I think, who defined neuralgia as the "prayer of a nerve for healthy blood," and it is a very good definition.

Finally, among the remedial agents to be used in neuralgia, we may enumerate cod-liver oil and the whole series of animal fats,

Thompson's solution of phosphorus, Duquesnel's aconitia, commencing with one-two-hundreth-grain doses, and carefully increasing until physiological effects are produced, arsenic, quinine, gelsemium, cannabis indica, the cautery, the galvanic or constant current of electricity, and the hypodermic use of morphia and atropia.

By judicious treatment, even in the worst cases of facial neuralgia, we may accomplish perfect cures by carefully studying each individual case as it presents itself for treatment, and noting the pathological causes and associations of neuralgia. Thus, a cerebro-spinal neuralgia may depend upon inflammatory action in a limited portion of the cord or of the theca vertebralis. We may see intense neuralgia with caries of the spine; also in the spinal nerve, situated at the seat of the disease. The neuralgia caused by carious teeth, and caries and exfoliation of bone, will cease upon the removal of the cause.

I have met with many cases of severe visceral neuralgias where the trouble was evidently local and not the effect of a pre-existing morbid condition of the central nervous system, as in hæmorrhoids, impacted fæces, and affections of the urinary organs, when, upon the removal of the pathological cause, the neuralgia disappeared and did not return. I have seen violent malarial neuralgias completely cured by a single twenty-grain dose of quinine after a purgative had been administered.

Tumors of the brain, ossific deposits in the pia mater and near the base of the brain, exostoses and caries of the cranial bones, are all pathological causes of inveterate protracted neuralgia. The pain in these cases is dependent upon irritation of a portion of the trunk or ramifications of the affected nerve. I have a case at present under observation where the neuralgia, which is very severe, is dependent upon disease of the jaw. The exostoses, when they are the pathological cause of neuralgia, are situated in the frontal sinuses, or in the ethmoidal or sphenoidal bones, or on the roots of a tooth. Superficial injuries, punctures, or cicatrices have also often occasioned neuralgia of a severe type. Sudden and forcible extension of nerves by tumors, aneurisms, or dislocations are also causes of neuralgia. Also contusions of the nerves may cause severe neuralgias; punctures of the nerves occasion often terrible neuralgia, lasting long after the injury, and associated with tremors and even convulsions of the muscle supplied by the injured nerve.

The fibrous enlargement which is left after the inflammation has subsided may give rise to the most serious neuralgia, which nothing

but division of the nerve will relieve. If a nerve becomes involved in the cicatrix of a wound or burn, severe neuralgia will result; also if a nerve be severed by an injury.

Chloroform is one of the most valuable topical irritants in neuralgia that we possess, and the profession is probably familiar with M. Brown-Séquard's conclusion recently advanced, "That chloroform applied to the skin of an animal produces a local anæsthesia without passing through the circulatory system." It must be applied so as to intensely irritate the extremities of the peripheral cutaneous nerves, and even in the severe pains of locomotor ataxy, through the relations of the peripheral sensitive nerves with the posterior spinal roots, it alleviates these pains very markedly. The treatment of neuralgic pains by mechanical vibrations is of much interest now, being advanced by Dr. Vigoroux, of France; and from my own experience with localized faradization, irritating the skin by the mechanical vibrations of the induced current of electricity in cases of sciatica and locomotor ataxia, I can partially confirm his theory as a practical one. I have certainly seen rapid relief of pain by such peripheral irritation. The galvanic current also relieves pain by its revulsive effect when other agents have proved ineffectual. Dr. Vigoroux's experiments in treating and relieving pain by the vibrations of the tuning-fork, causing an anæsthesia in recurrent neuralgias, I have not yet employed. Dr. Vigoroux claims that the vibrations of the tuning-fork have the same physiological action in alleviating pain as has electricity. The action of the vibrations is localized by arming the terminal point of the tuning-fork with a wooden button, which is applied over the nerve which is the seat of pain, the terminal disc not to be of a diameter exceeding one centimetre. The effects are said to be the most rapid when the applications are over a sensitive nerve-plexus. When applied near the foramina, where the branches of the fifth pair of nerves pass out, the relief from the pain is rapid. Also in hemicrania or migraine, when the vibrations were communicated to the cranial walls rapidly, the pain was quickly relieved. I have no doubt at all of the truth of these statements, as they accord entirely with my own series of experiments with the induced or magnetic current of electricity for the relief of facial neuralgia and migraine. In my experiments I have not found that the rapidity of the vibrations seemed to matter much, local anæsthesia and analgesia being produced in typical cases of neuralgia of the fifth pair of nerves, and also in migraine, in both instances.

In concluding this article on neuralgia, I wish to allude to nerve-stretching for the relief of the neuralgic pain in locomotor ataxy. The nerve should be reached by an incision two and a half inches long; a grooved director, with the convexity upward, is then to be passed under the nerve to be stretched, and then, by grasping the two ends of the director, traction may be made on a line perpendicular to the axis of the nerve, with sufficient force to lift it about two inches. There is no danger of injuring the nerve by this operation, which I propose to have performed, in all cases of mine hereafter, whenever necessary to relieve the "lightning" pains of locomotor ataxy. The sciatic, crural, median, and radial nerves may all, I think, be very advantageously stretched in these cases, not only with great relief to pain, but with great improvement to incoördination; and, I think, this comparatively new operation will have great success in the hands of skilful operators.

Professor Erb, of Heidelberg, in writing on the diagnosis and treatment of neuralgia, speaks as follows respecting electricity as a therapeutic agent in the treatment of neuralgia, and my own experience certainly confirms the truth of his statement:

Electricity has recently become the most important remedy in the treatment of neuralgia in consequence of the brilliant success that has attended its application in many different forms of the disease, and in no other disease are the results of electro-therapeutical treatment so certainly established as in neuralgia. Of the two kinds of electricity now in constant use, the galvanic current (continuous current) is found to be the more active and applicable to a greater variety of forms of disease than faradic electricity. Faradic electricity (the interrupted current) is chiefly useful in peripheric neuralgia, when the nerves can be reached by the current, and in cases where no remarkable anatomical change, as neuritis or the like is present, and thus especially in the so-called purely idiopathic or "habitual" neuralgia.

The galvanic current has at least the same action upon peripheric neuralgia, whilst, in addition, it is very effective in the central and deep-seated forms of the disease (cerebral and spinal neuralgias and neuralgia of the roots of nerves). Moreover, by its "catalytic" effects,—that is to say, by its influence on the vessels, upon exudation and the processes of nutrition,—it exerts a wide effect on those neuralgias which are influenced by the faradic current. There are two methods of applying faradic electricity (interrupted current): *a*. By conducting a strong current of the secondary spiral for a few minutes through the nerve by means of moist electrodes, one of them being placed on the nerve-trunk as near as possible to its central origin; this plan must, for the most part, be frequently repeated. *b*. By producing energetic irritation of the skin with an electric brush, in the region of the distribution of the nerve at its point of emergence and over the points douloureux. The application of galvanic electricity is especially intended to modify the nutritive processes taking place in the nerve, to produce the so-called catalytic effects, and to lower the irritability of the nerves. The result of its application, either according to the polar or the direction method, seems to be equally good. In the polar method, the anode (positive electrode) is applied first upon the nerve trunk (when

possible, in the immediate vicinity of the proper focus of the disease) and then upon the point douloureux, and the cathode (negative electrode) upon some indifferent point.

In the direction method, the descending direction is used by preference, and the anode (positive electrode) is then to be placed upon the plexus or upon the roots of the nerve, and the cathode (negative electrode) is to be placed upon the nerve-trunk and the painful points. As a rule, the duration of the sitting should be short, extending over from two to eight minutes, and repeated daily, or every other day.

The strength of the current must in general be moderate. The effects are usually experienced at once, and continue for a variable period, from two or three to twenty-four hours, ultimately, after a variable number of sittings, becoming permanent.

On cases treated successfully by the spine-bag, Dr. John Chapman, Physician to the Farringdon Dispensary, London, says:

The cure of neuralgia, whether the disease be treated by drugs given internally, or by applications of various kinds at the seat of pain, or by the two methods conjointly, is confessedly almost always difficult, and in a large proportion of cases impossible. The cases reported below have been treated by a method altogether new. By stating each case with extreme brevity, I am enabled to present at one view within a small compass the results of several experiments; and I do this in the hope that they may produce such an impression on the minds of professional readers as may impel them to acquaint themselves with the pathological and therapeutical principles of which these results are an expression. I shall hereafter publish an exposition of those principles, illustrated by reports of cases *in extenso*, and shall then give a full description of the treatment adopted.

1. *Facial Neuralgia.*—T. H., a gentleman, aged 35, who had been suffering during the previous fortnight, requested my advice March 18, 1865. He was in great pain, which had been continuous from the previous day, and which had wholly deprived him of sleep. The pain was chiefly on the right side of the face and head; but during the morning preceding my visit the left side had become invaded. The affected parts were very tender, and somewhat swollen. The head was rather hot, the face flushed, the tongue thinly coated with whitish fur; pulse 92, full and strong. Several medicines prescribed by two physicians in succession had proved of no avail.

I applied a ten-inch spinal water-bag, containing water at 130° F. to the cervico dorsal region, and shortly afterwards left the patient's room. Within half an hour I returned, when I found him asleep. The treatment was continued for two days by means of heat; afterwards I used ice (at first in the lumbar region), and from the time he first fell asleep he continued free of pain, which has not since returned.

2. *Facial Neuralgia.*—Fräulein S., aged about 25, consulted me February 3, 1867, on account of neuralgia affecting the infra-orbital and dental branches of the trifacial nerve. The pain was not confined to one side of the face, but was sometimes most acute on one side, sometimes on the other; it increased at night, and kept her awake the greater part of each night. She had been suffering in this way for about three weeks before I saw her. Her general health was good. The affected part presented no trace of hyperæmia.

She was treated by means of ice, and experienced almost immediate relief. After three days of treatment she felt and slept very much better; and before the end of the fifth day the pain had wholly ceased. Nearly a year afterwards she told me that it had never returned.

3. *Facial Neuralgia.*—Mademoiselle M., aged 20, consulted me in August, 1867, when she was suffering from acute facial neuralgia, the chief foci of which were the infra-

orbital foramen and the mental foramen of the right side. The extreme pain came on in fits, sometimes at 8 A.M., sometimes at 2 P.M.; but between the paroxysms the face continued to ache, and at times the patient had pain at the back of the head. She had suffered in this way about a fortnight before coming to me, and had had several similar attacks during the preceding year.

The treatment consisted in the application of the double-columned hot water-bag. The malady was immediately subdued; no distinct paroxysm occurred after the first application of heat; all pain rapidly and completely subsided, and since that date has not returned.

4. *Dental Neuralgia.*—A. W. B., a Russian gentleman, suffering from dental neuralgia, consulted me in September, 1867. The malady was chiefly confined to the teeth of both upper and lower jaw, but no particular tooth or teeth seemed to be especially affected. The pain was intermittent, and so severe as to interfere seriously with the patient's daily occupation. No cause of the disorder, which had continued some weeks, could be discovered; and the face, so far from showing any sign of hyperæmia over the seat of pain, seemed cooler than normal. In the course of the first day of treatment by means of the spinal ice-bag, the pain was completely subdued; the cold was persisted in for some time, and during the remainder of the patient's stay in England he continued free from suffering.

5. *Dental Neuralgia.*—H. E., female, aged 21, suffering from violent and continuous pain, spreading over the teeth and gums of both the upper and lower jaw, consulted me January 17, 1868. The pain was most intense in the lower jaw and on the left side; she had intense headache also. The forehead and cheeks were notably hotter than normal, and she complained of great heat in the roof of the mouth as well as in the gums, which were swollen and sore. During the previous week she had had several teeth stopped with gold; one of them became most especially painful; and there was threatening of an abscess at its root.

The treatment consisted in the application of cold across the occiput, and of heat over the cilio-spinal region,—in the first instance separately, and afterwards simultaneously. The pain was speedily and completely annulled; it recurred, and was again annulled by the same method on several occasions. The patient volunteered the statement that, during the application of the heat, her mouth became perceptibly cooler.

6. *Facial and Brachial Neuralgia.*—Mary A. T., aged 44, first consulted me at the Farringdon Dispensary, December 28, 1867, when she was suffering from neuralgia of the right side of the head, face, and neck, and along the right shoulder and arm, extending to the fingers. The right half of the tongue was also affected. The pain, which was exactly limited to the median line, was described by the patient, "like as if something is pulling the flesh off the bone, it's so dreadful, and sometimes as if the parts were screwed up in a vice."

She was treated by means of ice applied along the whole spine. She improved immediately and rapidly, and, as early as January 15th, informed me that she had not had "a bit of neuralgia" during the whole of the preceding week. Up to this date (February 22d), the pains have not returned.

7. *Intercostal and Hypogastric Neuralgia.*—Miss E., who first consulted me January 14, 1865, complained of extreme pain on the right side of the lower dorsal and upper lumbar vertebræ, extending outwards and thence forwards to the right hypogastric region. The pain had continued every day and night, with occasional intervals of three or four hours' release from suffering, and had lasted about twenty years. The pain was so distressing and wearing that the patient's strength had become much impaired, especially by loss of sleep, and she was unable to undertake any regular occupation. The only sleep

she could get was induced by brandy and narcotics. She suffered also nearly every morning, and frequently throughout the day from nausea, and occasionally vomited "water."

I directed the patient to leave off brandy, opium, and morphia at once and entirely, and treated her chiefly by means of ice along the lower half of the spine. As early as February 14th, the patient was enabled to say to me,—"During the last few nights I have slept throughout the night without being disturbed at all, an experience quite new to me." On the first of the following April she informed me that she had already been many days absolutely free from pain. The nausea and vomiting had ceased, and the bowels had become "open every day—quite a new feature." I have since heard from time to time that this patient continues well.

8. *Intercostal Neuralgia.*—A man came to the Farringdon Dispensary, October 21, 1867, and complained to Dr. Drysdale, whose patients I was seeing with him, of acute pain along one side of the chest; no assignable cause for it could be detected, and we regarded it as a case of intercostal neuralgia. I recommended the application of the spinal ice-bag along the dorsal spine twice a day. "Sometime afterwards," as Dr. Drysdale related to the Harveian Society, "the man returned to the dispensary looking so delighted that the doctor asked him what was giving him so much pleasure? when he replied that the 'ice-bag had done him a world of good; it had taken away all his pain with wonderful quickness.'"

9. *Intercostal Neuralgia.*—Mary B., aged 51, first seen by me November 27, 1867, complained of intense pain over the right shoulder, between the scapulæ and along the right side of the chest. During the attacks of pain, which came on and went away suddenly, the flesh, she said, quivered and tingled. She felt her body bent down as if she could not move it for fear of the pain.

She was treated by the application of the spinal ice-bag along the lower half of the spine during an hour twice a day. The patient was surprised to find herself already quite free from pain during November 29th and 30th. Early in December it recurred very slightly, but on the 18th she said she remained free from neuralgia, except slight pain in the evening when fatigued by her work; she became much stronger, and was not so "nervous;" by December 28th all pain had gone; and February 26th, when I last saw her, it had not returned.

10. *Chest-Ache.*—October 21, 1867, I was asked at the Farringdon Dispensary by Dr. Drysdale to prescribe for one of his patients, Maria Williams, aged 22, who was then suffering from continuous aching beneath the right clavicle, together with "dreadful pains" in the head, dizziness, heaviness in the morning, and profuse leucorrhœa, which had lasted several months.

I prescribed the application of a narrow 16-inch ice-bag along the spine during 30′ twice a day,—the bottom of the bag being placed on a level with the fourth lumbar vertebra.

October 26th. The patient reported that the ice-bag had done her "a wonderful deal of good;" that the leucorrhœa had stopped, and that *all* her head symptoms had vanished. I requested her to persist in the treatment previously prescribed. By November 2d the pain beneath the right clavicle had quite ceased, and no one of all her troubles previously got rid of had recurred.

11. *Mammary, Ovarian, and Uterine Neuralgia.*—H. M., a girl aged 17, who was first seen by me February 24, 1863, and who was suffering from daily attacks of epilepsy (*petit mal*), complained of extreme pain in the region of the left ovary, which was tender on pressure, and increasingly so immediately before the patient's menstrual periods; also

of pain in the right mamma, which was considerably larger than the left, and of "fearful cutting pains" in the womb during menstruation.

I treated this case chiefly by means of iced-water applied along the spine. The result was complete cessation of the mammary, ovarian, and uterine pains; the mammæ became of equal size; and the epileptic vertigo, which had continued many years, ceased entirely a month after the treatment began, and has never recurred.

12. *Neuralgia of the Legs.*—I was consulted June 25, 1867, by Mr. ——, M.P., aged 49, who complained of excruciating neuralgia in the legs. The pain was of the ordinary tearing, shooting, and stabbing kind, sometimes in one limb, sometimes in the other, and affecting one heel almost continuously. This was often so acutely tender that he could not bear to touch the ground with it. As a rule the patient suffered most at night, and could rarely get any refreshing sleep. The malady came on about sixteen years ago, and had recurred at intervals ever afterwards. Until the morning he came to me he had never been free of intense pain for nineteen days. The patient was in the habit of drinking daily about a pint of sherry, which I advised him to give up.

The treatment consisted in the application of a spinal ice-bag along the lumbar and the lower half of the dorsal vertebræ. The patient informed me, July 25th, that, "practically speaking," he had had no pain since he began the treatment, and that he had slept well. I advised perseverance with the ice, and abstinence from wine. The patient wrote to me, August 21st, "I continue to receive great benefit from the ice application, and shall continue it." The pain afterwards recurred in a mitigated form, but was greatly subdued by the ice, and, I incline to believe, would be quite cured if the patient would wholly abstain from wine.

13. *General Neuralgia.*—June 22, 1855, I was consulted by Lord ——, on account of neuralgia affecting different parts of the body; the walls of the chest and the lower extremities were chiefly involved. The attacks generally came on suddenly, and lasted about fifteen hours, sometimes longer. The pains were of an acute, stabbing, and seemingly spasmodic character, and were often brought on by vigorous muscular exercise, especially deer-stalking, which his lordship is very fond of, but which his attacks either cut short or prevented him from indulging in.

I prescribed the application of ice along the spine, and five grains of citrate of iron and quinine during a few days at a time occasionally. When I saw the patient again, April 27, 1866, he informed me that he had applied the spinal ice-bag as directed during several weeks at a time at three successive periods since he consulted me. He declared himself so greatly improved that he had been quite free from his malady for long periods together; that, when it had recurred, the pains had been comparatively slight; that he could resume violent exercises, including deer-stalking, without bringing on an attack; and that in his opinion, had he continued the treatment regularly for a longer time, he should have been completely cured.

14. *General Neuralgia.*—Hannah E. complained to me, January 4, 1868, at the Faringdon Dispensary, of great pain in all the four limbs, but most especially in the fingers and toes, and in the left side over a spot about the size of half-a-crown; of headache each morning; of "dreadful" backache; and of excessive irritability of the bladder, involving the necessity of urinating about every five minutes.

She was treated by the application of the lumbar ice-bag, 90′, twice a day. Within a week the pain in the limbs was almost wholly gone. By the 15th of January it, as well as her headaches, had quite ceased; her back was much better; and she was obliged to micturate only about every hour. On the 5th of February she reported herself free from every pain on account of which she had consulted me, and the irritability of the bladder was so much lessened, that she was only troubled with it at intervals of about 90′.

On certain forms of visceral neuralgia, Dr. Clifford Allbutt, Leeds, says:

[Neuralgia of internal organs has only lately received the attention which it deserves.]

Gastralgia is, perhaps, the commonest form of pain, from which some neurotic patients suffer, and it really is so easy to distinguish from dyspepsia, that one regrets the more they so commonly are confounded. Its occurrence in the persons I have described makes it scarcely necessary to add that it is far commoner in women than in men. I do not remember ever seeing it as a larval form of malarious disease. Our present physiological knowledge discredits its supposed connection with the cœliac plexus, and refers the seat of pain rather to the vagus; this, indeed, our clinical knowledge supports, for Anstie has shown that gastralgia often runs with angina and with asthma. It occurs mostly after the following fashions: Sudden and violent pain may seize the gastric region, sometimes biting right into the epigastrium, sometimes darting through to the back, sometimes gnawing at almost all the sternal region, sometimes twisting and griping from the epigastrium round the false ribs to the left. The attacks may come on so suddenly as (in one case now under my care) to interrupt the sufferer in conversation, and drive him into another room to writhe in secret, or they may come on more gradually, and never reach any great degree of intensity. In either case they have periods of greater and less severity, and of actual remission, long or short. Pressure, as in colic, generally relieves rather than aggravates, and the attack passes off to recur at intervals which seldom seem to observe any remarkable constancy. With the sensory disturbances are often associated motor disorders. In one marked case—that, to which I have already alluded—the stomach is the seat of volcanic movements of a flatulent character, as flatulence is associated also with abdominal colic. Twistings and irresistible gatherings of wind, which belch loudly from the throat, may accompany, follow, or replace the gastralgia, are dreaded by the patient as much as the pain, and are amenable to like palliatives,—to subcutaneous morphia, for instance,—while they set all alkalies, carminatives, antiseptics, and stomachics at utter defiance. In other instances some catarrh of the stomach is associated with gastralgia, as diarrhœa may accompany "interalgia," but this is less common. More common is vomiting, which may be spasmodic, or may be a revolt of the hyperæsthetic stomach against the touch of the food. In the case of Sarah S., which I shall presently describe, the vomiting was a very prominent symptom. In some cases functional disturbances, elsewhere seem not only to be an outcome of the same general habit, but to be directly consequent upon the gastralgia itself, though, of course, this is hard to prove. Irritable heart and wiry pulse, however, are very often associated with gastralgia in a way which seems rather direct than indirect. Asthma and angina seem rarely to have the direct but often the indirect connection, as they occur, not at the same time, but at different times in the same person. Spasm of the abdominal walls is often present; perhaps we should always find it if we stripped the patient. The recti abdominis are knotted and the belly and epigastrium are nipped into hollows. This is mainly a reflex act, and the parts are at once released (as I have had occasion twice to notice) by a few whiffs of chloroform. "Points douloureux" seem scarcely to exist; certainly the epigastrium is rarely so tender as in dyspepsia and gastritis. Most persons, unless of a very vigorous and hard condition, have occasional tender vertebræ; and few women will not complain of differences in places when the spinous processes are successively pressed. The paroxysms may give way as suddenly as they came, or they may vanish slowly; the intervals are generally complete, or nearly so, but the motor disturbances may intervene and the interval be diversified by uncontrollable belching or capricious vomiting. Nausea, I think, is rare. Now, from what has gone before, it will be seen that the confusion be-

tween gastralgia and dyspepsia is not to be excused. There is no sharp pain from the epigastrium to the shoulders, consequent only upon injection of food, and relieved by vomiting or the prone position. The pain takes its own times of ebb and flow quite independently of digestion, for in some cases indeed food gives relief; not long ago I almost cured a gastralgia by advising a patient, who had been starved for dyspepsia, to go home and live as generously as he could for a fortnight. He was utterly amazed to find that, so far from being the worse for it, he was actually better and better. Nor are there any truly dyspeptic symptoms; the tongue is rarely coated; red at tip and edges it may be, but often it is of thoroughly normal aspect; nor do the other symptoms, as observed in the secretions, in abnormal vomits, risings, acidity, and the like, bear out the supposition of present dyspepsia. At the same time, the mucous membrane of these neurotics is often irritable, and may also be subject to intercurrent catarrh. In the vaporous neuralgics the tongue is frequently large, flabby, and white at the back, the breath rather faint in odor, and constipation invariable; while, in the irritable neurotics, the tongue is nearly always small and often red at the tip and edges, the breath, however, being sweet, and the motions, though often constipated, yet often again running into diarrhœa. Bismuth, with small opiate additions, or oxide of silver are not uncommonly necessary in the kind of dyspepsia which may undoubtedly complicate gastralgia.

It is with unusual pleasure we enter upon the treatment of gastralgia, for, instead of admitting our weakness, here we are certainly strong. Individual cases may, indeed, thwart us; but, as a rule, we can hardly fail to bring considerable relief. The continuous current I have rarely tried in visceral neuralgias, and, gastralgia being so often a complaint of women, it is seldom convenient to make any local application of this remedy. The first step to be taken, after forming a diagnosis, is to assure the patient that his complaint is not dyspepsia but neuralgia, and to put him upon diet as liberal as the worried stomach will tolerate. This must be done carefully. There are to be no large full meals, but small quantities of light nutritious food at frequent intervals during the day. Rum and milk in the morning, a little meat for breakfast, without much slop, a raw egg or a basin of soup at noon, a chop at the luncheon hour, with a glass of sherry and vegetables in moderation, tea and bread and butter at five, meat and light pudding at half-past six, with another glass of wine, and before bed a small cup of revalenta, with a biscuit. Cod-liver oil will in most or many cases be required. And the patient, being released as to diet, must now be strictly warned as to the real causes of his ailment; anxiety in home or business, many important engagements, prolonged suckling, teaching in schools during hours due to relaxation, reading at night, social dissipations; all these causes of "wear" must be inquired into and disposed of. The next important indication is to administer such medicines as the case seems to call for on more general grounds. Anæmia, which cannot alone cause gastralgia, but often favors its manifestation, must be met by steel and aloes. I think Dr. Anstie has said that the tincture of the sesquichloride of iron seems to have a special power over neuralgia,—a power which can scarcely be due to a mere improvement in the blood. This may be so; certainly in one case of obstinate frontal neuralgia, with a white lock of hair, which was long under my hands, and in which everything, galvanism included, had failed; in this case, large doses of the tincture of the sesquichloride succeeded better than any other remedy. But the same thing used to be said concerning the carbonate of iron, and probably with equal truth; so that the special virtue, if any, resides in the metal, and not in one of its salts alone. It would appear, then, that in iron we have two kinds of value; its value in ordinary small doses and in mild forms, when it removes simple anæmia, and its value in large doses,—doses such as half a drachm to a drachm of carbonate of iron, or of twenty to

thirty drops of the sesquichloride tincture,—when it seems, apart from the presence of any definite anæmia, to have a special effect in modifying the morbid state of nerve-tissue. The same is true in some sense of quinine. This drug may be used in common doses of about a grain as a simple tonic, or in doses of ten to thirty grains as an anodyne. But I have here to refer to its use in the former way only, for large doses of quinine seem to have little palliative value in gastralgia, a fact which surprised me, seeing that the trigeminal centre and the vaso-motor centre, over which they have such power, are close to the nucleus of the vagus. Probably, however, quinine governs trigeminal neuralgia indirectly through the intermediation of vaso-motor change. Be this as it may, small doses of quinine with strychnine make a capital chronic medicine for gastralgia; but large doses, as rapid agents, in this ailment seem impotent. In the above combination the strychnine is, however, the more valuable element, and few cases of gastralgia get on altogether without it. It probably acts best when given under the skin; but, until baffled in other attempts, one scarcely resorts to this form of administration. In the few instances where I have thus tried it, I have seen excellent results. Small doses should be repeated daily for several days, and the medicine carefully strengthened, if necessary, as its effects are seen. But of all the remedies for gastralgia arsenic is king, and to the use of arsenic I was led, when ignorant of its use by others, by noting the frequent concurrence of certain skin affections with gastralgia. Eczema, psoriasis, lichen, herpes, urticaria, all run with gastralgia in the irritable neurotics, and the eruptions generally occur in active, spreading, itching, hyperæmic, symmetrical forms. In gouty persons, on the contrary, they are generally circumscribed and chronic. Arsenic, then, has some remarkable power, not over skin affections in general, but as they occur in these neurotics; and it likewise cures or relieves their migraine, their tics, their asthma, their angina, their gastralgia, their colic, their capricious diarrhœa. Arsenic has not any specific power over skin affections merely as such, and hence the frequent disappointment of those who so use it; but it is a remarkable modifier of a certain peculiar constitutional habit, of which, probably by way of the nervous system, it obviates the morbid tendencies. I always prescribe Fowler's solution in any simple water, a dose of which, containing three to five drops of the solution, is taken largely diluted thrice daily with meals. It should be carefully pushed to the edge of its physiological effects. The only palliative remedy of any importance is morphia used hypodermically, and of this I shall treat when I come to speak also of ovaralgia; of the lesser palliatives the best, I think, are ether and chloroform given internally in small doses.

Respecting the treatment of "epileptiform neuralgia," Francis E. Anstie, M. D., F. R. C. P., Senior Physician to the Westminster Hospital, has made some important remarks upon the treatment in the earlier stages of that terrible kind of facial neuralgia to which Trousseau gave the name of "epileptiform."

Trousseau has described, with the brilliant eloquence so peculiarly his own, the tragic prospect which the sufferer from spasmodic tic has before him; how hopeless it is that he should obtain a cure, and how certain that any relief obtained by remedies will be followed by a return of all his sufferings. He has laid it down as an absolute law that we are to expect nothing but a temporary respite or alleviation; and he then proceeds to say that this minor amount of good is to be procured by very large and increasing doses of opium better than by any other means.

There is no doubt that Trousseau's description of spasmodic facial neuralgia, as a dis-

ease hopeless of cure, was, at the moment, nearly correct. He is evidently speaking of a malady quite different from the milder neuralgia which may occur at any time of life,—a neuralgia which is rare, is confined to certain highly neurotic families, and which, among those families, only attacks a limited number of individuals who have passed the prime of life and entered upon the period of organic degeneration. The pain is of frightful severity, and is all the more difficult to bear because of the agonizing suddenness with which it darts through the affected nerve, perhaps aroused by some trifling and necessary muscular movement, such as mastication. That very large doses of opium are required to produce any great impression on the disease, if the medicine be given by the stomach, is also perfectly true. These doses must be continued, and rapidly increased, with the unfailing effect of seriously disordering the functions of digestion and assimilation. And, after all, the best result attainable is, that for a few weeks or months there may be a notable diminution of the severity of the pain, but with the certainty that, sooner or later, it will revive in all its intensity, and that then opium nor anything else will produce any perceptible impression upon it. The remainder of such a patient's life is rendered additionally miserable, in most cases, by a total derangement of digestion and consequent failure of nutrition.

Dr. Anstie believes that a very much better result than this may be obtained if the malady be treated, from an earlier stage, according to the following plan: 1. Counter-irritation of a peculiar kind. 2. Nutritive tonics. 3. Subcutaneous injection of morphia, or of atropia, according to circumstances.

1. Counter-irritation, to be useful in epileptiform facial tic, should not be applied to the branches of the fifth, but to those of the occipital nerve, at the nape of the neck. A blister in the former situation is as often hurtful as useful; in the latter it is sometimes strikingly effective in gaining a short respite. And this is of very great importance in this awful disease, for the mere fact of such pain being allowed to continue is itself the worst possible omen. 2. The assiduous use of cod-liver oil, or of some fatty substitute for it, should be insisted on from the first, and is of the highest consequence. 3. Subcutaneous injection places us in a totally different position toward the use of opium in spasmodic tic. There is no longer any excuse for the use of enormous doses of opium from the first. It will be sufficient to commence with the use of one-sixth of a grain of morphia twice daily, increasing this, if necessary, to one-fourth and one-half a grain, and, in rare cases, to one grain. If this produces, along with the other measures, a notable remission of the pain, it should be cautiously and steadily decreased, as circumstances may admit. In cases where morphia fails, atropia may be tried, in doses commencing at one-sixth of a grain. The injection of a less quantity than this would probably be useless in severe tic.

Hopeless as was the cure of this form of neuralgia under Trousseau's plan, or any other which might be directed to the object of deeply narcotizing the patient, the prospect is by no means so cheerless when the subcutaneous injection is employed, with the precautions above mentioned. Although Dr. Anstie cannot say that he has ever seen a positive and complete cure of a facial neuralgia setting in under the conditions which have been described as peculiar to this disease, it is certain that the experience of those who have used the subcutaneous method extensively has proved that the attacks may be kept at bay, and their severity greatly mitigated when they occur; with this general result, that the setting in of a facial tic in the later period of life, even in a patient whose family and constitutional history is of the worst augury, is no longer a fatal warning of life-long and scarce endurable misery. The economy in the necessary use of opium effected by the use of hypodermic rather than gastric administration is enormous; and this not merely for the purpose of producing a given effect by a single dose, but also

(which is most important in regard to the preservation of digestion and nutrition) with regard to the rate of increase in the doses.

In the above remarks reference has only been had to those modes of treatment which are within the reach of every practitioner. It is necessary to state, however, that for those who are so circumstanced as to be able to provide themselves with proper apparatus for the generation of a constant galvanic current, the prospects of effecting good in even the most seemingly hopeless cases of spasmodic facial tic are very greatly increased. It is impossible for any candid person to study carefully the treatise of Benedikt without coming to the conclusion that we have in the constant current a remedy capable of effecting much more, in these severe cases, than any treatment by drugs, or any other means. A low-tension current from a Daniell's battery (using from five to fifteen cells, according to circumstances) applied daily in *séances* of a few minutes, appears sometimes to entirely arrest facial neuralgia of the worst type, and commencing under the most unfavorable omens. Especially may we indulge hope, as it seems to me, in regard to the results which may be obtained from the galvanization of the sympathetic, in cases which would otherwise afford no rational hopes of more than the most trifling amendment. Any very condensed account of this mode of treatment would be likely to mislead. To those who possess the requisite preliminary knowledge of electricity and electro-physiology, and also the opportunities of providing themselves with the somewhat expensive and troublesome luxury of a really effective constant battery, our author urges the necessity of a careful study of the English treatise of Althaus, and the German treatises of Remak, Benedikt, and Meyer, upon the medical uses of electricity. They will find facts therein which will at once arrest their attention, and engage them seriously in a most important branch of the therapeutics of nerve-pain.

CHAPTER XXIX.

LOCOMOTOR ATAXIA, CEREBRAL HYPERÆMIA, CEREBRAL SOFTENING, AND CEREBRAL SCLEROSIS.

Locomotor ataxia, or posterior spinal sclerosis, is a disease of the nervous system, characterized in its inception by paroxysmal wandering "lightning pains;" by a diminution of the patellar tendon reflex, so that, if a quick tap is made midway between the lower end of the patella and the tuberosity of the tibia, the quadriceps extensor femoris does not contract as it does normally, and we get no jerk of the leg as we should do; by diminution of the vesical and rectal reflexes, so that both micturition and defecation are impaired; impairment of the pupillary reflex, paralysis of the ocular muscles, and incoördination of the muscles. There is also plantar anæsthesia. The incoördination of movement is frequently so great that the

patient cannot walk without assistance. We may also find in locomotor ataxia the *crises gastriques* of Charcot, attacks in which there is pain in the stomach and chest, with continual retching and vomiting occurring at irregular intervals. There is apt to be distension, with pain in the stomach, and griping and flatulent eructations. To recapitulate, these patients have a staggering gait, diplopia, inability to stand with the eyes shut; pupils insensitive to light, and analgesia of the extremities. There is a peculiar arthropathy, or osteo-arthritic change, apt to occur in locomotor ataxia, in which we meet with great disorganizations of certain joints and spontaneous fractures, owing to an alteration of nutrition in the osseous tissue, dependent upon an influence of the nervous system. There is also an extremely rapid wearing away of the articular extremities.

This extremely interesting subject of the osseous and articular lesions of locomotor ataxia has as yet received very little attention except from Dr. Charcot, of Paris. In this condition of the wearing away of the articular extremities of the long bones they can be knocked together audibly and without pain. There may be also extensive painless swellings of the joints, not confined to the joints, but extending down the long axis of the limb. As a result of the erosion and absorption of the head and neck of bones dislocations frequently occur. These spontaneous fractures generally take place while the patient is walking or making slight movements. There may be great distension of joints, with relaxation of the ligaments and deformities from the removal of natural eminences and the deposit of masses of the bone. These arthritic changes are neurotic, and are essentially different from those of chronic rheumatic or osteo-arthritis, which attacks the larger in preference to the smaller joints. The fluid effused is of great quantity, and not limited to the joint, but, as I have said, expands underneath the muscles extending down the long axis of the limbs. The head of a bone in ataxic arthropathy is destroyed with great rapidity. The synovial membrane and bone are alike affected. The incoördination of this disease is probably to be accounted for by the inequality of tonicity of different groups of muscles, and also the loss of the muscular sense. It may, perhaps, be partly due to a limited muscular paralysis. Respecting the therapeutics of this disease, we have as yet failed in classing it among the curable affections of the nervous system, although there are a few cases on record of cure. Personally I have obtained great relief from the use of the constant current of electricity—galvanic

current—using the negative pole at the sacrum, and rubbing the positive pole, to which is attached a sponge electrode up and down the spine, and on either side of the sixth and seventh cervical vertebræ, so as to quiet the irritation of the posterior roots. I think in one case, by counter-irritation, by small fly-blisters along the course of the spine, by the constant current applied as I have described, and by the use of the chloro-phosphide of arsenic—Routh's formula—in 5-minim doses, thrice daily, I succeeded in curing one case in its incipient stage, making my patient use crutches. I also gave cod-liver oil freely, and the patient was made to rest as much as possible. The nutrition of the spinal cord was markedly increased by these means. In my case there was no incoördination, and no loss of the pupillary reflex, but the patellar tendon reflex was much diminished, and the lightning pains and partial amaurosis were present. I think if we could see this disease in its incipient stage, which we seldom do, that we might hope, by appropriate treatment, for better results than we generally obtain. To relieve the pains, both the galvanic and faradic currents are sometimes very useful, as are also the hypodermics of morphia, and sometimes chloroform locally, a lock of cotton being saturated with it and placed under a watch-glass on the affected part. The tribasic phosphate of silver has lately been recommended by Dr. Allan McLean Hamilton as a remedy, in ⅓-grain doses, with the effect, it is claimed, of relieving pain and incoördination.*

Nerve-stretching is also, I think, destined to play an important part in relieving the terrible lightning pains of locomotor ataxia. I think that the incessant pains, which undergo exacerbations, can be

* Dr. J. Lockhart Clarke speaking of the prognosis and treatment of this disease says, that the prognosis is generally very unfavorable. An early diagnosis is of the greatest importance, as it is chiefly at the first invasion of the disease that the patient is most benefited by treatment. An important object is to protect the patient from cold and wet and keep him in an equable temperature. The whole of the body should therefore be enveloped in flannel. A good and generous diet, with wine or beer, seems best suited for the patient. Of the different medicines that have been used, nitrate of silver seems to have the most specific influence on locomotor ataxy. ⅛th of a grain gradually increased to one grain three times a day, after meals, is the best mode of exhibition. If it should irritate the bowels or bladder, it may be combined with morphia, cannabis indica, or belladonna. The oxide of silver is a useful substitute for the nitrate, when the latter disagrees. Dry cupping along the spine has been found useful. For the relief of the severe limb-pains there is nothing so efficacious as the subcutaneous injection of morphia. Dr. Clarke has always found that constipation aggravated the pains. He recommends cod-liver oil, phosphorus, rest and the constant or galvanic current of electricity.

very much relieved, and that after either the sciatic, crural, median, or radial nerves are reached by incision, they should be lifted about two inches, as, by M. Gillette's operation, recently performed in Paris on M. Debore's patient, the traction on the nerve being made in a line perpendicular to the axis of the nerve. There is no fear of injuring the nerve, and experience teaches that the incoördination is greatly improved, and that immense relief to the pains is afforded, and they may even entirely cease. I would insist on the fact, and Dr. Radcliffe, of London, also advances it in his writings that, in some cases of locomotor ataxia, we may get a very decided amendment in the symptoms of the disease. The disease is generally, I think, confined to the lumbo-dorsal portion of the cord, and rarely ascends so as to implicate the cervical portion of the cord. Locomotor ataxia may be distinguished from common chronic paraplegia by the fact that in the former disease there is no true paralysis either in the lower extremities or anywhere else. The gait is also very different,—in locomotor ataxia the *heels* come down at each step with a stamp, while in paraplegia the *toes*, as a rule, touch the ground first; and the gait, instead of being precipitate and staggering, is difficult and slow. The frequent impairment in sight or hearing, the strabismus or ptosis, injection of the conjunctiva, and the characteristic neuralgic pains of a boring and shooting character, are not found in chronic paraplegia. In diseases of the cerebellum, although we find a reeling and rolling gait, we do not notice the precipitate, staggering gait of locomotor ataxia; neither do the heels come down with a stamp. If a careful examination is made, I see no opportunity for a careful physician to make a mistake in the diagnosis of this disease.

It is of great importance that an early diagnosis be made in this disease if we are to get better results from treatment than formerly. We should remember, therefore, that we have in the first or premonitory stage of locomotor ataxia, paroxysms of pain of a neuralgic character, wandering, and of a stabbing, boring nature, generally in the feet and legs, a diminution of the patellar tendon, vesical, rectal, and pupillary reflexes, numbness in the feet and legs, a plantar anæsthesia more particularly.

As the disease progresses, we see the peculiar gait and the characteristic incoördination of movement, so that the patient is obliged to use a stick in walking; strabismus, ptosis, injection of the conjunctiva and perhaps contracted pupils, and in some cases some

mental impairment, although this, I think I am right in saying, is rather a rare symptom. Dr. Rumpf, of Düsseldorf, has exhibited to his medical society a typical case of locomotor ataxia beginning with shooting pains in the legs, then weakness in walking, abnormal sensation in the feet and hands, tightness around the waist, and weakness of the bladder, passing at last into ataxia of the upper and lower extremities, with muscular force little impaired, but diminished sensation of the whole body, both to impressions of touch and heat and cold. Dr. Rumpf first saw the man, who was 40 years of age, on the 29th of July, and on the 29th of September following he was quite relieved and able for work. The only treatment used was the interrupted current,—the positive pole applied to the sternum and the electrode of the negative pole applied to the back and down the extremities. The strength of the current was strong enough when applied to the median nerve to cause convulsions (by which is probably meant powerful contractions). The applications were ten minutes long and every other day. The improvement began at once. The pains disappeared, the sensibility returned, and the feeling of tightness disappeared also. The galvanic current was used at the beginning of September, alternating with the faradic. This case was reported in the *Journal of Mental Science* of July, 1882.

Dr. Buzzard, of London, has exhibited to the Pathological Society of London three typical cases suffering from osseous and articular lesions in the course of locomotor ataxia. The first of these was a man in whom the right hip-joint was completely disorganized, the head and neck of the femur having entirely disappeared within about three months. The second case was a woman of 50 years of age, who was a patient of the National Hospital for the Paralyzed and Epileptic. This patient had suffered for about eleven years from typical "lightning" pains in her legs and arms, and had been affected for about the same time with attacks of the *crises gastriques* of Charcot,—attacks in which there is pain in the stomach and chest, with continual retching and vomiting, occurring at irregular intervals, sometimes as many as four in four months, the longest period of exemption having been eight months. The other symptoms she exhibited were an ataxic gait, very small pupils not reacting to light, analgesia of extremities, defective muscular sense, and absence of patellar tendon reflex. One day, while walking along her ward in hospital, her right femur fractured through its neck. About one year later, while vomiting in bed, her left hip-joint suddenly "bulged out." Since then

she has been unable to use either leg. Upon careful examination the movements of both hip-joints were found free, but limited in some directions, with crepitation more marked in the right than in the left. On the right side the top of the great trochanter was nearly level with the anterior superior spinous process, and on the left the trochanter is extremely prominent and the bone enlarged. The conditions observed might be due, it was thought, either to spontaneous fracture of the neck of the bone on each side, or to complete disorganization of the joint, with atropic changes and absorption of the neck and head of the bone on the right side, and similar changes on the left, associated with enlargement of the great trochanter from throwing out of new bone.

The third case was that of a woman of 36, married, and an outpatient of the National Hospital for the Paralyzed and Epileptic. She had been a patient of Professor Henry Smith's in the King's College Hospital. This patient had for ten years been subject not only to the typical lightning pains in her extremities, recurring at intervals of a month or two and lasting three or four days, but also had had very characteristic *crises gastriques*. These had occurred at irregular intervals, between which she had felt quite well. She had never passed six months without an attack. She had distension, pain, vomiting, and retching and griping, and flatulent eructations, recurring daily for weeks at a time. Her other symptoms were staggering gait, diplopia, inability to stand with eyes shut, partial color-blindness, pupils insensitive to light, and analgesia of extremities. Three years ago her right leg became red and swollen, but not painful, and these symptoms subsided under rest. In June, 1878, they recurred, and in September the swelling had gone down, but the knee-joint was useless. At the same time, the left leg began to swell, and was larger than natural when she was admitted into King's College Hospital at the end of the year. At that time the right knee-joint was found to be disorganized. There was grating, but no pains on moving the ends of the bones. The internal condyle was enlarged, and projected inwards. The external condyle could not be felt. The patella rested on the outer surface of the lower end of the femur, the ligamentum patellæ being wasted. There was fluctuation in the joint. The left leg was swollen, and this knee-joint, which was apparently not affected on admission, became enlarged, and the leg dislocated outwards and backwards during the patient's stay of one month in the hospital. The muscles of the lower extremities were

wasted. She was discharged at the end of January with leather supports to each knee, which enable her to move about with help. There has since been swelling and crepitation of the right shoulder-joint. At the last report, it felt as though all ligamentous connections had disappeared from the right knee-joint. The ends of the bones could not be brought into apposition, and they were so loosely connected that the patient, before she put on the leather casing, had to splice them together with a bandage. They can be knocked together audibly, and without pain. It seemed as though the condyles had been levelled off and the end of the femur turned into a rounded and smooth stump, whilst the upper end of the tibia is bevelled off inwards. The patella lies two inches above and to the outside of the end of the femur. Along the outer side of the inner hamstring was a firm, smooth, rounded mass, one inch by half an inch. On the left side the tibia and fibula were dislocated backwards and slightly outwards. The condyles were rounded off, the inner one being enlarged. The patella lay over the end of the femur in front.

These are very rare and interesting cases, and I am indebted for them to the *Report of the Pathological Society of London*, of which J. Hutchinson has been the president. Charcot first described this arthropathy occurring in tabes about fourteen years ago, but little attention has been paid to it here.

The first case described in England was one by Clifford Allbutt, in 1869. The second one was reported by Dr. Buzzard, of London, in the *Lancet* of 1874. In France, cases have been described by Vulpian, Richet, Dubois, Bourneville, Voisin, Bourceret, and Talamon. The great disorganization of some of the joints, and the multiple spontaneous fractures, depend primarily upon an alteration in the nutrition of the bone, dependent upon nervous influence, and are in themselves secondary to this faulty osseous nutrition. The very rapid erosion and absorption of the ends of the bones is very distinctive.

Dr. Buzzard, of London, has suggested that, as the gastric symptoms might, with some confidence, be ascribed to sclerosal invasion of the roots of the vagus, very probably a change in some structure contiguous to these in the medulla oblongata might be discovered to be the lesion giving rise to the altered nutrition in the osseous system.

Charcot, of Paris, had one case of a patient suffering from locomotor ataxia, in whom the head of the humerus, apparently unaltered

in shape, was displaced under the clavicle, and projected strongly under the skin; the bone was quite loose, with free and painless mobility. The opposite humerus was dislocated on to the dorsum of the scapula, and one knee was dislocated, the tibia and fibula being twisted and displaced up behind the femur, which was deformed from the loss of its outer condyle. In all these joints there was, according to Professor Charcot, remarkable freedom of mobility and absence of pain, and the femur was greatly altered in form.

Respecting progressive locomotor ataxy, Dr. C. B. Radcliffe, Physician to the Westminster Hospital, and to the National Hospital for Paralysis and Epilepsy, etc., says:

This malady was discovered seven or eight years ago by M. Duchenne (de Boulogne), and described under the name of *ataxie locomotrice progressive*. In it there is no deficient action of the will upon the muscles individually, and no loss of muscular force or change of muscular structure; but there is deficient action in that involuntary instinctive coördinating power by which various groups of muscles are made to work harmoniously together in such acts as standing, walking, or handling. The term ataxy (*a*, primitive, and τάξις, order), which has reference to the deficiency in proper coördinating power, is not very fortunate, for the adjective *ataxic* is very commonly used in a different sense, as in ataxic fever, where what is meant is low fever, in which nervous exhaustion is the predominant condition. To meet this difficulty other names have been suggested, but *the* satisfactory name has yet to be found, and for the present, therefore, we must be content to use the one employed originally, and call the disease in question ataxie locomotrice progressive, or progressive locomotor ataxy, or ataxy simply.

Until M. Duchenne (de Boulogne) drew attention to it, ataxy was confounded with spinal paralysis in general, and especially with that vague form of this paralysis which is known under the name of *tabes dorsalis*. The disorderly movements of the muscles were regarded as symptoms of paralysis. It was not perceived that the muscles in which these disorderly movements were manifested were healthy, and behaved well in all respects except when they were called upon to act in concert. Moreover, it was not known that this loss of coördinating muscular power simply was associated with other symptoms in a definite category. In a word, to M. Duchenne (de Boulogne) must undoubtedly be ascribed the honor which belongs to him who discovers a disease, sufficiently definite in its character, which had been confounded previously with other and very dissimilar diseases.

The case which serves me for a text is now in the wards. It is that of J. C., a sailor, thirty-four years of age, living at Islington, and admitted into the National Hospital for Paralysis and Epilepsy, on the 3d of April, 1865. The notes I have run thus:

Present Condition.—J. C. is a man somewhat under the average height and weight, well-proportioned, well-developed as to muscle, especially in the upper parts of the body, with scarcely any subcutaneous fat, with abundance of brown hair on the head and face, and with a complexion much dried and browned by long exposure to sun and sea.

He is capable of walking without a stick, but his gait is peculiar—staggering, precipitate, the legs thrown about vaguely and spasmodically, and the heel brought down with force at each step. With his eyes shut, or in the dark, he reels over at once, and would fall helplessly unless prevented from doing so. In the sitting posture he can lift either

leg steadily into any position, and keep it there; and when the leg is put out in this manner he can keep it extended, in spite of a very strong effort on my part to flex it. In order to this, however, he must see what he is doing, for, if his eyes are shut, the leg at once becomes unsteady, and little force, comparatively, is required to bend it. The right leg is a little weaker than the left, but not to any very considerable degree. He finds it very difficult to come down stairs, or to quicken his pace much, and he is speedily fatigued by the acts of standing or walking. On being told to shut his eyes, and touch his nose with his forefinger of each hand in turn, he did so with tolerable accuracy, especially with the forefinger of the left hand. On being told to stretch out his arms, and keep them out, he did so quite well, but only so long as he was allowed to see what he was doing, for on holding a book before his eyes, his arms, shoulders, and neck and head—the upper part of his body generally—at once became affected with convulsive titubation. When the book was taken away these movements speedily came to an end, but not before they had issued in a fit of crying and sobbing, which was not a little distressing to witness. This fit took the patient quite by surprise; and it could not be accounted for by the examination having been conducted roughly, or carried on for an undue length of time; indeed, the holding of the book before the eyes, which was its immediate cause, did not occupy more than a minute at the most.

The muscles of the lower limbs generally are less developed than those of the upper limbs and trunk, but there is no appearance of wasting in them. Their electro-contractility is perfect; they stand out firm and hard when made to contract by the will, and the contraction seems every whit as strong as it ought to be. Indeed, as has been stated already, when the leg is put out and stiffened, it is not in my power to bend it against the will of the patient, except by the exercise of great force. There is no tremulousness anywhere; and no marked reflex movements are produced by tickling the soles of the feet.

What the patient complains of chiefly, are excruciating, stabbing, boring, nipping pangs of pain, flitting from one spot to another in a very erratic manner, in paroxysms lasting from a few minutes to twelve, twenty-four, or forty-eight hours; and generally fixing upon one spot only in any single paroxysm. These pangs are most frequently felt in the two feet, especially about the outer side of the metatarsal bone of the little toe; they are also felt not unfrequently at the back of the thighs, in the nates, and in the upper arm about the lower part of the belly of the biceps. They are scarcely ever absent, especially at night; at night, too, there is often a sensation of great coldness, with some degree of constriction, in the painful parts.

Measured by the compasses, tactile sensibility is found to be much impaired in the feet (especially in the soles), in the lower halves of both legs, and to some degree, also, in the back of the thighs, in the nates, and in the palms of the hands. The ground is felt very obscurely, but so far as it is felt the sensations are accurate—that is to say, it does not seem to the patient as if there were elastic cushions, pebbles, or other imaginary bodies, or as if there was nothing at all, under the feet.

Very rough pinching is scarcely at all felt in the benumbed parts, but elsewhere the sensibility to painful impressions is keen enough.

In the benumbed parts, also, and in a lesser degree in some other parts, muscular sensibility (and with it probably the proper sensibility of the joints and bones) is manifestly diminished. In bed, for example, when there is no light, J. C. says that he cannot clearly tell where his feet are, and that not unfrequently his legs get quite out of bed without his knowledge. There is also very little feeling of pressure when the muscles of the feet and legs are squeezed with considerable force; and in the arms, as well as in the legs, the faculty of measuring and adjusting the amount of muscular action necessary for any given

act is evidently not as much alive as it should be. For instance, when two weights are placed in his hand, one after the other, one of them being at least a pound heavier than the other, he finds it difficult to say with certainty which is the heavier of the two.

The sight of each eye is defective, and glasses afford no relief. The pupils are equal in size, and respond fairly to the light. The conjunctivæ are injected. There is no arcus senilis. There is no squinting or ptosis.

The hearing of each ear is so dull as to make it necessary to speak in a very loud tone in order to be heard. There are also constant singing and booming noises in the ears—"almost like the wind in the shrouds," he says.

The memory is bad, the spirits are very despondent, the head generally "feels very heavy," and of late (this statement is volunteered by the patient) there has been a frequent temptation to commit suicide.

The pulse is feeble, and about 70 in the minute. The appetite is good. The bowels are somewhat constipated. In any case a long time is spent over a stool; "it won't come out," is the patient's own description of the trouble in this quarter. The urine is also voided slowly and with difficulty, although the urethra is free from stricture, and now and then it escapes in bed at night. Sexually, the state may be spoken of as approaching to, if not amounting to, spermatorrhœa.

Previous History.—Five years ago J. C., it appears, began to suffer from pains in the legs and back, and to be unsteady in his gait; about the same time, also, his sight and hearing began to fail, and from that time to this he has continued to get gradually worse and worse. Four years ago he had a sun-stroke in the West Indies, of which the immediate symptoms were violent agitation and shaking, without loss of consciousness, and for which he was taken into an hospital and bled; but this accident was twelve months *after* his present malady had commenced, and, therefore, it is not possible to look upon it as a cause of this malady.

C. was at sea seventeen years in all, chiefly in hot climates, as the West Indies and West Coast of Africa, and he continued at sea three years after he had begun to suffer from unsteadiness of gait and from the other symptoms which have just been mentioned. Once during the time he was at sea he had chancres, without secondary symptoms, and repeatedly he had the diarrhœa, but, with these exceptions, his health on all occasions appears to have been very good. He says that he was always very careless, often sleeping almost without clothes upon the bare deck or upon the ground, and that he was always "too much given to drink and women." For the last two years the sexual power has been much damped; but before this time, according to his own showing, he appears to have been little better than a very satyr. Two years ago, when obliged to abandon his calling as a sailor, he was for a while treated in the hospital at Quebec for rheumatism. Afterwards he found his way to this country, and became an out-patient first at one hospital then another. During this time he appears to have been frequently blistered along the spine, and on one occasion to have been salivated. For the rest I have only to add that his father died early in life of consumption, that his mother died young from some unknown chronic disease, and that a brother, the only member of the family besides himself, is now dying of the disease which proved fatal to his father.

M. Duchenne, whose description is the best as well as the first, marks out three stages in the course of the malady, of which this case is an example. In the first stage, the patient suffers from paralysis, often temporary only, of one or other of the motor nerves of the eye, from some degree of amaurosis, usually accompanied by unequal pupils, and from the peculiar boring, erratic pangs of pains from which C. suffered. In the second stage, in addition to the symptoms of the first stage, the characteristic unsteadiness of gait begins to show itself, together with diminished sensibility to touch and pain in the skin

of the lower parts of the legs, in the skin of the soles of the feet especially, the interval between the first stage and the second varying in length from a few months to several years. In the third stage, the malady becomes more profound and general, the disorder in involuntary coördinate movement increasing in the legs and extending to the upper parts of the body, the anæsthesia increasing in the parts first affected and extending to other parts, not of the skin only, but even to the muscles, joints, and bones. M. Duchenne does not consider the affections of the bladder, the rectum, and the genital apparatus as essential symptoms of the disease in any one of these three stages; he speaks of them as "epiphénomènes" only.

So far as it goes, the history of C. does not tally with this division of the disease into stages, for in it the failure of sight, the pains, and the irregularity of instinctive coördinate movement are seen to have made their appearance together. Nor is this history altogether exceptional in this respect; and therefore the only conclusion to be drawn is that there are some cases, perhaps the majority, in which the symptoms admit of being grouped in the three stages indicated by M. Duchenne.

In the majority of cases, undoubtedly, the principal symptoms of ataxy agree with those which are met with in C.'s case. There is the same irregularity of involuntary coördinate movement in muscles perfectly healthy in other respects, the same peculiar pains, and the same anæsthesia. Still there are other cases in which the pains or the anæsthesia are either not very conspicuous phenomena or else absent altogether. Thus, I have met with four cases out of seven, not very advanced in degree it is true, in which there were no pains to speak of, and with two cases (out of the same seven) in which there was no anæsthesia. In the majority of cases, perhaps, the eyesight fails at an early period, and in many cases this failure is associated with some paralysis, often transitory, of the motor nerves, one or other, of the eye, or of some branches of the motor nerves of the face; but there are other cases in which none of these phenomena are present. In a word, the affections of the bladder, rectum, and genital apparatus are not the only features which must be looked upon as accidental, as "epiphénomès;" and the simple truth is, that the idea of the disease becomes clearer just in proportion as this fact is clearly realized.

Ataxy, it is said, may be confounded with several diseases, especially with simple loss of muscular sensibility, with disease of the cerebellum, with general paralysis of the insane, with general spinal paralysis and common paraplegia, with saturnine paralysis, with Cruveilhier's disease, with paralysis agitans, and with chorea and some other affections of the kind; but fortunately, as a rule, very little attention will serve to prevent such confusion.

Simple loss of "muscular sense" has been supposed to be the cause of ataxy, and undoubtedly this is a malady frequently associated with ataxy, and most easily confounded with it. In *simple* loss of muscular sense, however, the sight can supply what is lost; and thus, when the eye is open and the attention alive, the involuntary coördinate movements, as well as the voluntary movements of the affected muscles, are all executed regularly.

In disease of the cerebellum there appears, at first sight, to be the same disorder in muscular movements as in ataxy, but this similarity is deceptive. There is now, curiously, in the same ward, and also under my care, a boy in whom there appears to be some congenital defect in the cerebellum, want of due development probably. This boy has had a very peculiar gait; he reels and rolls about in walking as if he were giddy or drunk; there is nothing peculiar in the way in which he plants his feet; and this way of walking is precisely that which appears to me more or less characteristic of disease in the cerebellum. In ataxy, on the other hand, the gait, as has been said, is staggering, precipitate, the legs thrown about vaguely and spasmodically, and the heels brought down

with force at each step. There is something very peculiar in the way in which the feet are planted; the gait does not give the idea of giddiness; there appears to be some want of balance between the flexors and extensors in each leg, the flexors having the advantage; and, in addition, the muscles, when they act, seem to contract with a sort of jerk,—spasmodically. In *certain* diseases of the cerebellum, also, other symptoms are likely to be present which will assist in the formation of a correct diagnosis, especially violent pains, augmented by movement, in one or other part of the head, and frequent and obstinate vomiting. Moreover, in these diseases the onset is generally sudden, and the progress uncomplicated with the peculiar pains and anæsthesia of ataxy proper.

In general paralysis of the insane, the hesitation in speech, the tremulousness of the lips and tongue, the general tremulousness, the true paralytic weakness of the muscles as to voluntary movement, and the mental condition of the patient, must readily serve to prevent the unsteadiness of gait and other evidences of disordered co-ordinate movement from being confounded with those which occur in ataxy; and in other respects, also, the features of the two diseases are sufficiently distinct.

In general spinal paralysis and in common paraplegia there is true paralysis, more or less complete, of the muscles as to voluntary power; and the muscles, moreover, are much damaged as to their nutrition and contractility, and generally as to their sensibility, too. In the majority of cases, also, formication is associated with numbness, and, what has never yet been noticed in ataxy, the sensibility to difference of temperature is much impaired or altogether lost in the paralyzed parts. Very generally there is tenderness in some part of the spine, and not unfrequently pain in the same region or in the paralyzed parts; and, if there be pain, it is, as a rule, more like dull rheumatic aching than like the peculiar excruciating, stabbing, boring, nipping pangs of pain, flitting from one spot to another in a very erratic manner, and occurring in paroxysms of varying duration, which are present in C.'s case, and which are rarely absent in cases of the kind. And, in those cases where progression is possible, the gait is almost always sufficiently characteristic—*not* staggering, precipitate—the legs thrown about vaguely and spasmodically, and the heel brought down with force at each step, as in C.'s case and in other cases of the kind, but hampered and slow, partly from want of voluntary power over the legs, and partly from the muscles becoming stiff in moving, each leg being brought forward with evident difficulty, even with the help of an upward hitch of the whole side of the body belonging to it, and the part of the foot first brought in contact with the ground being as a rule, not the heel, but the toes.

In saturnine paralysis it is the voluntary power over certain muscles which is impaired and gone, and the muscles are atrophied and deprived of electric contractility when the malady has reached its height. Indeed, it is difficult to understand how this affection can be confounded with ataxy.

In Cruveilhier's disease, as I showed in a former lecture (*Lancet*, January 16, 1865), the wasted muscles are changed in great measure into fat, and, as it were, dissected away, and any errors in movement are such as may be accounted for by this atrophy and absence; whereas in ataxy the muscles are plump, and to all appearance perfectly healthy, and the errors of movement are those which refer to want of proper involuntary coördinating power. Moreover, in Cruveilhier's disease the pains and anæsthesia of ataxy are not met with.

In chorea there is great want of coördinating power in muscular movement, but the rest of the history is quite different from that of ataxy, so different and so well known as to make it altogether unnecessary to recall it to your memory. And so likewise in regard to those other affections which come into the same category as chorea.

And lastly, in paralysis agitans a mistake cannot well be made, for the general features

of the disease are more akin to those which are present in general paralysis than to those which are characteristic of ataxy.

In some cases Duchenne's disease has been associated with other diseases of the nervous system, as with Cruveilhier's disease, or with general spinal paralysis or common paraplegia, and in these cases the distinctive characters of the disorder may be somewhat masked; but in ordinary cases there can be but little difficulty in arriving at a correct diagnosis.

The pathology of ataxy is yet in its infancy. The most marked change detected after death as yet is degeneration and disappearance, more or less complete, of the posterior columns and of the posterior roots of the nerves of the spinal cord. Mr. Lockhart Clarke has shown me some beautiful microscopic slides, which furnish most conclusive proof of this fact. But I am not prepared to think that these are the only changes to be met with. On the contrary, I fully believe that corresponding changes will eventually be found in those parts of the cerebrum, wherever they are, which have specially to do with the co-ordination of muscular movements.

The prognosis is full of gloom. The progress of bad to worse may be slow, very slow, but as yet there is too much reason to believe that the term "progressive," in the sense, of going on from bad to worse, is not misapplied. Still I know of two cases which justify a much more hopeful opinion.

The treatment in C.'s case consists in good food and rest, in hypophosphite of soda and cod-liver oil, and in the electrifying of the region of the cord with free positive electricity, and we shall see in time whether any good will come out of it. I am not very sanguine; at the same time I have this to encourage me—that this is the kind of treatment which has done and is doing good in the two cases to which I have just referred.

Dr. Julius Althaus, Physician to the Royal Infirmary for Diseases of the Chest, City Road, says:

[This disease, recently described by French physicians as progressive locomotor ataxy, was first described more than thirty years ago as tabes dorsalis, yet the nature of the complaint and the connection which exists between the symptoms manifested during life and the structural changes found after death have, until quite recently, been misunderstood.]

Tabes dorsalis is first spoken of in the works of Hippocrates, and was by the father of medical literature believed to arise from excesses in sexual intercourse, the chief symptoms of the disease being spermatorrhœa, marasmus, and hectic fever. This meaning of the term, however, has gradually changed, and those authors who wrote on tabes in the first decennia of this century understood by it atrophy of the posterior portion of the spinal cord, brought on, not merely by sexual exhaustion, but also by exposure to wet, rheumatism, gout, and other causes, the chief symptom being a peculiar form of paraplegia. The disorder was chiefly investigated by English and German physicians, such as Abercrombie, Hufeland, Steinthal, Romberg, and others. Their descriptions, although in some instances most eloquent, were, however, to a certain extent, wanting in accuracy, inasmuch as several different affections of the cord were comprehended under the name of tabes, and a clear distinction was not drawn between tabes and paraplegia. It was only after a more careful clinical study of the symptoms had been made, and after pathological anatomy, aided by the microscope, had stepped in, that a peculiar disease of itself, and one characterized by uniform structural lesions, could take its place in our nosological system. The chief credit of the anatomical investigations is due to Professors Virchow, Türck, Rokitansky, and Leyden, and in this country to Dr. Gull and Mr. Lockhart

Clarke, who have shown that, in well-marked cases of tabes, an actual waste of nerve-fibres of the posterior columns of the spinal cord takes place, together with the formation of amyloid corpuscles and considerable proliferation of connective tissue.

The first who drew a distinction between this disease and paralysis was Dr. Todd. He said in an article on the nervous system in his *Cyclopædia*, that two kinds of paralysis might be noticed in the lower extremities; the one consisting simply in the impairment or loss of voluntary motion; the other distinguished by a diminution or total absence of the power of co-ordinating movements. In the latter form, while considerable muscular power remained, the patient found great difficulty in walking, and his gait was so tottering and uncertain that his centre of gravity was easily displaced. In these few words we have a good description of the system of *ataxy*, upon which lately so much stress has been laid by French physicians. The term "ataxy" is as old as that of "tabes," for it also originated with Hippocrates; and it has likewise entirely changed its meaning in the course of time. Some authors have applied it to chorea, others to fevers, others to various nervous disorders. At present, however, we understand by ataxy, not a disease of itself, but merely a symptom to which various disorders may give rise, and which essentially consists of a want of co-ordination of voluntary movements, and a tendency on the part of the patient to lose his balance, but without actual loss of power, and apart from tremor, chorea, and paralysis. This symptom may be observed in disease of the cerebellum, and in poisoning by alcohol, lead, and mercury; but it is more especially connected with that disease which has been long familiar to us as tabes. The best clinical study of this symptom we owe to M. Duchenne de Boulogne, who, from 1858 up to this time, has published a number of memoirs, in which he described what he thought to be an entirely new disease, which he called "progressive locomotor ataxy," and which he believed to be a functional disorder of the cerebellum. His apparent discovery was hailed as a real one in France, and Professor Trousseau actually proposed to call the new stranger "Duchenne's disease;" but, on looking more closely into the matter, we find that Duchenne's description is altogether applicable to our old friend, tabes. I have not the slightest hesitation in acknowledging the great ability and originality of M. Duchenne's researches, which were perhaps more strikingly displayed in this case just on account of his being unacquainted with the previous literature on the subject; yet, if I thought it desirable to attach a proper name to this affection, I should prefer calling it "Todd's disease," as Todd first drew the distinction between ataxy and paralysis eleven years previous to Duchenne. But the best plan is, perhaps merely to drop the term "tabes," as being too vague, and to call the disease under consideration "progressive locomotor ataxy, or wasting of the posterior columns of the spinal cord."

The following details of a case of this affection, which I have had under my observation for about five years, are well suited to illustrate the symptoms and progress of the disease:

R. B., a commercial traveller, aged 37, a tall and rather spare man, with a sallow complexion, first consulted me in February, 1860, when he gave me the following history. His mother had always been healthy, but his father had for the greater part of his life suffered from epilepsy, and died in a fit. The patient was brought up to the law; but in consequence of a disappointment he left that profession, and enlisted as a soldier. He served in Australia and Canada, and during that time suffered much from rheumatism. He never exceeded in drinking, but occasionally in sexual intercourse. He twice had gonorrhœa, but no syphilis. He suffered for a long time from hæmorrhoids, for which, in 1855, he underwent the operation by ligature, and he ascribed the commencement of his present illness to that operation, saying that he never felt quite the same man after the hæmorrhoidal flow had ceased. He left the army in 1856, and married. He is

now father of a healthy child. For the last eighteen months he has been a commercial traveller, and as such he is always on the move, and frequently exposed to cold, damp, and great fatigues. In January, 1857, he first noticed that his sight became weak, and he had some difficulty in writing and reading small prints. Soon after he felt pains of a peculiar character, which he described as electric shocks through the legs, and as if the muscles were being rent asunder. These shocks came every two or three minutes. He underwent treatment by liniments and other external applications, but without relief. His gait now became tottering, and he had considerable difficulty in walking. He never goes out without a stick, and sometimes he is obliged to use two. In the summer of 1859 he consulted the late Dr. Todd, who told him that his case was incurable, and that he would have to be on the sofa for the rest of his life. He prescribed strychnine and iron, and after having taken it for some time the patient felt rather stronger, but there was no improvement in the special symptoms of the disease.

Present State.—February 14th, 1860: The patient's intellect, memory, and speech are quite normal. He does not suffer from headache, giddiness, strabismus, or ptosis. Both pupils are enlarged, the left more so than the right. He complains of weak sight, and the ophthalmoscopic examination shows the arteries of the optic nerve smaller than usual. His senses of hearing, smell, and taste are natural. Respiration and heart-sounds normal; pulse at the wrist rather feeble, but quite regular. His digestion is tolerably good. Tongue clean, appetite satisfactory, but bowels rather costive. He complains of a sensation as if a net were tightly drawn round the abdomen. He is occasionally troubled in passing the urine, but there is no stricture. The urine is of 1030 specific gravity, and contains a sediment of urates, but no excess of phosphates, and no albumen or sugar. The sexual power has not notably diminished of late. On examination of the back by pressure, percussion, galvanism, and hot sponges, no place can be discovered which is particularly sensitive. The patient complains of numbness in the hands, more especially in the third and fourth fingers of the left hand. He can distinguish heat and cold, and feels the prick of a pin and pressure distinctly; yet the æsthesiometer shows a considerable diminution of tactile sensibility in the fingers. The upper extremities are pretty well nourished, and the muscles answer well to a galvanic current of moderate power. He can bend and stretch the arms with force, but he finds it difficult to button his shirt and to feed himself. The lower extremities are more affected than the upper ones. The patient has had sensations of "pins and needles" in the feet, but these have for some time past given place to numbness. He says that in walking he has a sensation as if the steps rose under his feet. He must continually look at his limbs in order not to lose his balance, and can scarcely walk at all in the dark. If told to shut the eyes or stand with both feet together, he begins to stagger. In walking he throws the legs forwards with a jerking motion; and, as he cannot measure his distance from the ground, he puts his foot down with great force. If lying down he can bend and stretch the legs with considerable power; but he seems to exaggerate every movement, all muscular contraction being, not slow and equable, but violent, sudden, and jerking.

I ordered the patient thirty minims of the syrup of iodide of iron three times a day, sulphur baths twice a week, and a pill of aloes and myrrh at bedtime. After having used these remedies for about a month, there was a marked improvement in every respect. The pains were nearly gone, the sight was rather better, the walking decidedly steadier, and less fatiguing, and the feeling of numbness slighter. He went on favorably until March, 1861, when, having a long and very laborious journey to perform, he returned considerably worse, and from that time the disease gradually gained upon him in spite of all treatment. In 1863 he had a course of nitrate of silver, but the affection was then evidently too far advanced for any medication to do good. The sight got rapidly worse,

and he became at last completely amaurotic. The sensation in the lower extremities was also entirely lost. The patient was now confined to his room, and during the last six months of his life he never left his bed. His intellect remained unimpaired to the last, and his disposition was always cheerful. He died in January, 1865, of a sharp attack of bronchitis.

[The author then describes in detail the anatomical changes which are found in patients who have succumbed to this disease; after which he proceeds to an elaborate analysis of the special symptoms, laying chief stress on the affection of the cerebral nerves and the pains in the first stage, and on the symptoms of ataxy and the loss of the different kinds of sensibility in the second stage of the disorder. The causes generating ataxy are then mentioned, and the diagnosis is fully gone into. He then continues:]

The prognosis is not favorable, for up to the present time not a single case is on record in which perfect recovery has ensued. Indeed, as late as 1851, Romberg wrote that there was no hope for patients of this class, that a fatal issue was inevitable, and that it was but common humanity to inform them that therapeutic interference could only injure. This sad confession of impotence need no longer be made, and we may certainly congratulate ourselves on having far more control over the disease than we had formerly. Moreover, its progress is seldom rapid, although acute intercurrent disorders, such as erysipelas, bronchitis, and pneumonia, are grave complications, which may carry the patient off suddenly. Much must depend upon the period at which the case comes under treatment. If all the symptoms of the disorder are fully developed, the hope of a cure may be slight, although even then much may be done to alleviate the patient's suffering. The case is different if the patient presents himself in an early stage of the disorder. The fact that the cerebral nerves, with the exception of the optic, generally recover from their affections in the course of the disease, goes far to prove that previous to the structural changes in the cord there is a functional stage, in which much may be done by medicines. Moreover, we must bear in mind that Messrs. Charcot and Vulpian have found nervous fibres in the process of reparation in the cord of a man who had died from ataxy; and that therefore even at a later time we must not give up hope altogether, especially if the patient is placed in favorable circumstances.

I now come to the treatment of ataxy, and will first say a few words about diet and regimen. This must depend a good deal upon the condition in which the patient is at the time he comes under treatment. If he is in a weakly state, plain and nourishing diet, with iron, quinine, and cod-liver oil, should be prescribed. I have never seen a case in which lowering did any good. Hippocrates has recommended milk diet in erotic tabes, and Eisenmann speaks highly of the same in progressive ataxy. I have often given milk and brandy, two and even three times a day, with decided benefit to the general health, but have never found it expedient to insist on an exclusive milk diet. Exercise should be very moderate, and, for those who have undergone great fatigue, rest is most beneficial.

Counter-irritants to the spine have been used by many physicians, but, as a rule, the benefit obtained has not been proportionate to the sufferings inflicted by their application. The moxa, the hot iron, issues, blisters, and leeches have been employed. I give the preference over all of these to the continuous galvanic current, applied to the lower and middle portion of the spine. It has in several cases seemed to me of decided benefit in lessening the pains, and also the disagreeable feeling of constriction which is often felt at the abdomen and the chest. The action of this agent is as rapid as that of the iron; its application entails far less trouble and suffering than the latter; and its efficacy is superior to that of issues, blisters, and leeches. Dry cupping on both sides of the spine is also useful.

Iodide of potassium has been recommended by Duchenne and others; but no cases

have been published in which this remedy has proved successful. On the contrary, several are on record in which it seemed to accelerate the progress of the disease. I have given it in two cases, but without any effect, and am certainly not in favor of its administration. Iodide and bromide of iron are useful, but do not effect a cure. Mineral waters have been very frequently employed, both externally and internally; and it seems that for a time they do good. Amongst the French spas, Barèges is one of the most recommended; amongst the German waters, Marienbad and Wiesbaden have a special reputation; while chalybeates and indifferent thermal springs, which often prove useful in certain forms of paralysis, have entirely failed in ataxy. On the whole, I should be averse to sending atactic patients on a journey to some distant spa, as rest at home, with certain remedies to be mentioned hereafter, is more beneficial than all the mineral waters in the world. If, however, there should be costiveness and abdominal plethora, Carlsbad, Marienbad, or Kissingen water may be drunk at home with benefit. Sulphur baths may also be taken at home, and I think highly of them. I have never employed them alone; but they certainly seemed, in conjunction with other remedies, to do much in relieving the pains and diminishing the numbness. The patients feel more brisk and supple after the baths, and are almost always desirous of repeating them as often as possible. A sulphur bath may be prepared by dissolving from three to six ounces of the sulphuret of potassium in two pints of warm water, and adding this to the bath. Vapor baths and Turkish baths should be avoided.

Nux vomica and strychnine have frequently been used, but generally seemed to do harm. Duchenne recommends faradization, and the late Professor Remak, of Berlin, praised galvanization as a curative agent. From faradization I have never seen any benefit; galvanization has proved useful at my hands, not only in the pain and feeling of constriction, but also in the affections of cerebral nerves, which are so frequent in the commencement of ataxy; on the other hand, it has been powerless against the disease itself, more especially against the symptom of ataxy.

Amongst the other remedies which have been used in this affection without much result I will mention opium, bromide of potassium, secale cornutum, essence of turpentine, and arsenic. The only remedy which seems as yet to have done some good, in a very large proportion of cases, is the nitrate of silver, given in doses of one-tenth to a half grain two or three times a day. Professor Wunderlich, of Leipzic, was the first who employed silver in seven cases of this disease, in none of which, it is true, he obtained an actual cure, but in most of them considerable improvement. In 1862, Messrs. Charcot and Vulpian, in France, took up Wunderlich's idea, and used the nitrate in five other cases, and in each of them there was much amendment. Since then this remedy has been employed in most cases of ataxy, and with somewhat variable success. In some it has so disagreed with the patients that it was necessary to discontiuue its use; in others it had little or no effect; while in the majority of cases the remedy has proved, if not curative, at least very useful, and it is the one upon which most reliance can be placed in the treatment of this disease. I am in the habit of giving the silver combined with the hypophosphite of soda, and it seems to do far more in this combination than either of these remedies singly. I have, indeed, now a case of ataxy under my care in which the improvement has, for the last six months, been so considerable under this medication that I am hopeful of a cure. Certain precautions should, however, be taken in administering the nitrate. I generally employ it for four or six weeks consecutively, and then discontinue it for a fortnight or three weeks, giving in the meantime a slightly aperient mineral water. After this the use of the remedy may be safely recommenced, and continued for a month or so. The gums must be inspected from time to time, as the peculiar coloration which silver produces in the long run first appears in the mucous membrane, and

only afterwards in the skin. With the precautions mentioned, however, no disfigurement of the patient need be feared. I have never gone beyond the dose of half a grain, and perhaps this is another reason why in my cases the remedy has been borne without any inconvenience. I should, however, not recommend all cases of ataxy to be treated alike; in this affection we must, as in every other, study each individual case by itself, and advise for it what seems, under the special circumstances, most likely to do good. Thus hysterical or hypochondriacal patients in whom ataxy may supervene will require a different treatment from plethoric persons, or such as have long suffered from rheumatism, or have been subject to privations and anxiety. Much is, therefore, left to the tact and discrimination which, together with knowledge, should in all cases brought before him, guide the doings of the physician.

Dr. Johnson, at King's College Hospital, says:

[The disease known as locomotor ataxy has been much discussed within the last few years by Duchenne and others, under the name of "ataxie locomotrice." This disease had until recently been included in the class Paraplegia; but in well-marked cases there is no actual paralysis of the muscles, but loss of power to guide them. The patient is obliged to "lean on his eyesight as on crutches;" and if he shuts his eyes he stops, and sometimes falls. The posterior column of the cord is the part diseased. The following is the account of a case in a man forty years of age. He had from boyhood been engaged in the cod-fishery off Iceland, and thus for the greater part of the year was much exposed to wet and cold. The symptoms of the disease dated four years back.]

On admission, he was noted as a short, well-built, powerful man; no loss nor thickening of speech, and no deafness. He seemed to be intelligent, and gave a clear account of himself. The most characteristic point was his walk. He could stand very well with his feet apart, but when he put them close together he could not maintain his position, even when looking on the ground. On taking a step, he would advance in a hesitating, tottering manner. He always leaned forwards, and seemed to have some difficulty in balancing himself, especially when turning round. These points were better seen when he shut his eyes, for he was only able to totter a few yards, and then would fall. He walked pretty well when his eyes were off the ground, as when he was looking at the ceiling; but directly he closed his eyes he seemed to lose all confidence, and reeled like a drunken man. Although there was this loss of power in coördinating his movements, there was no loss of muscular power. He would lift heavy weights, and even carry patients round the ward. When sitting in a chair with bent knees, he could resist all attempts to straighten the legs. There was no muscular atrophy, and but slightly diminished sensation in the left hand. The left side was rather more affected than the right. It appears he had a chancre four years ago, but it came on after the first appearance of numbness in the leg. There were some syphilitic patches on the tongue. There was no sore-throat nor rash on the skin; no nodes, nor glandular swellings anywhere. Lung and heart-sounds healthy. Urine pale; specific gravity 1010; no albumen. Does not pass urine more than three or four times a day. His intellectual faculties do not seem impaired; he has slight loss of memory. His sight is not quite so good as it was. He has no pains in his head nor down the spine. Hearing and speech good. No affection of the cranial nerves apparently. Appetite good. Bowels open; no loss of power over the sphincters.

He was put on a liberal diet, and treated with iron and quinine. Galvanism was applied daily, with apparent benefit.

During his stay in the hospital he seemed to improve a little. At times he would walk

fairly well, but on wet days he was always worse, and depression of spirits would come on. He was discharged Feb. 8th, 1866.

In a case of progressive locomotor ataxy, under the care of Dr. Hughlings Jackson, at the London Hospital, he observed that this was one of the most interesting cases of locomotor ataxy that he had ever seen:

The patient was 39 years of age. The first symptoms observed, when 14 years of age, was loss of sight; but this improved so that in nine weeks he was able to see tolerably. He then became almost quite deaf, and then the sense of smell was lost. Taste has never been affected. There was also clear evidence of diminished sensation in the legs. The patient is liable to sudden and violent pains in the legs.

The patient can get along when his eyes are open; but his gait is precipitate, and he staggers. When he shuts his comparatively good eye, he can only manage to keep his legs for a moment. It is scarcely right to say that he can stand; a fairer description would be, he does not fall at once. He cannot stir a step with his eyes shut. Dr. Jackson particularly drew our attention to the fact that this patient could manage to walk when looking at the ceiling, although, of course, not so well in so awkward a position. He (Dr. Jackson) told us that a year ago he had had under his care a man suffering from locomotor ataxy who could walk whether he looked on one side or at the ceiling. And he remarked that, although most patients suffering from ataxy say they "must look at their feet," some can walk without doing so if their eyes are open. The last-mentioned patient could walk with his eyes shut if he merely touched a wall with his fingers without resting any of his weight on it. Another patient, who was quite blind, and whom we saw with Dr. Jackson at the Hospital for Epilepsy and Paralysis, averred that he could walk for a long distance in the park if he just touched the railing with one hand; and, on trial, it was found that he could get along much better than we could have expected in this way. More than one patient has said that, when they shut their eyes, they "feel as if there was nothing under them." It seems only necessary in these cases, Dr. Johnson said, for the patients to establish some definite relation with the objects about them. The patient's wife said that he began to stumble about a year after the blindness. He had first pain in his back, and there were some lumps on it; but no precise information could be obtained on these points.

The patient has had difficulty with his bladder eleven years, and this may possibly be essentially a motor defect. If so, it is the only paralysis. The patient can stamp well with his legs, can resist flexion and extension fairly, and his legs are well nourished. There is no paralysis of any one of the cranial motor nerves, nor any history of squinting.

The man seems intelligent. His talk is rather odd, but there is none of the thickness of general paresis about it. He talks in the loud harsh way some people, who have long been very deaf, get into. He was so deaf that it required much patience to obtain a few facts from him. Dr. Jackson at first tried to communicate with him by writing words of monstrous size on paper. In this way he got to know that the patient denied sexual excesses, and that he used to drink hard, and also, a fact that is worth notice, that he had smoked an ounce of tobacco a day for eighteen years.

GENERAL OBSERVATIONS ON ABNORMAL STATES OF THE BRAIN; CONGESTION, SOFTENING, AND SCLEROSIS.

1. *Cerebral Hyperæmia or Congestion.*—This state consists in an increase in the quantity of blood contained in the capillaries of the brain. It may be active or passive; the former, when the capillaries are filled with rapidly moving arterial, oxygenated blood; the latter, when from venous obstruction the capillaries contain slowly moving blood of a venous character. A man who is plethoric, or a child with a sensitive vaso-motor system, may have active cerebral hyperæmia, owing to increase of blood-pressure; or the man may have an active arterial dilatation of vaso-motor origin from prolonged mental work, severe moral emotion, sunstroke, gastro-hepatic disturbance, or from toxic poisoning, as by alcohol, etc., or an increased atmospheric pressure, or lying with the head too low. We may get a partial active cerebral congestion from disease of cerebral blood-vessels or organic disease of the brain.

Passive cerebral hyperæmia generally is the result of impeded return of blood from the head, due either to mechanical pressure on the veins, to tricuspid insufficiency with the associated condition of the lungs, or a diseased heart. Cerebral thrombosis in a vein, or a morbid growth or tumor exercising pressure on a cerebral sinus, may also be the cause of passive congestion.

Clinically, when we are called upon to see a case of cerebral hyperæmia, we shall find a good deal of mental irritability in our patient. Slight causes may cause quite an explosion of anger. If we evert the lower eyelid, we shall find dilated and tortuous blood-vessels, which indicate very well the condition of the cerebral circulation. The conjunctiva may be suffused, and the patient will complain of headache, which may be slight or intense, and of flashes of light before the eyes, noises in the ears, and there may be nausea. There may be also confusion of mind and sleeplessness. The patient complains of a feeling of fulness or of throbbing in the head, and the head is hot, and the face of a deep-red color perhaps. The pulse is rapid and irritable, or slow and labored, and the pupils contracted, and the sight dim and defective. Motor power is lessened, so that the patient feels unequal to even slight exertions. Patients are unanimous in giving a history of a heavy, unrefreshing sleep, if they do sleep, and of feeling much worse in the morning, and they complain of numbness in the extremities. Patients who pursue their ordinary

avocations do their work mechanically, and feel as if they were semi-conscious, and pay, perhaps, very little attention to what you say, owing to the overwrought condition of their nervous system. This state may last, if not relieved, for days, weeks, or months, and there is a convulsive form in which there are slight muscular spasms, with or without loss of consciousness. A maniacal delirium may develop, as the result of a subinflammatory irritation of the brain, set up by the hyperæmic state of that organ, although there is a distinct delirium of congestion of the brain found only in advanced years. If cerebral hyperæmia is not relieved, there is danger of apoplectiform attacks, in which Russell Reynolds and Bastian have shown that sensation, consciousness, and power of motion are lost. The patient's senses are temporarily in abeyance, and the pulse and respiration are disturbed for a few moments. These symptoms pass off in a half-hour, but if they recur are more prolonged, both in duration and intensity. In the preliminary or premonitory stage the patient, besides motor weakness and irritability, may complain of pains simulating the pain of locomotor ataxia. They differ in not being so severe, but they sometimes are very annoying, and I have known physicians to be much disturbed by them. They often, I think, accompany neurasthenia, with an overwrought state of the nervous system, and are merely dependent upon the hyperæsthetic state of the whole cerebro-spinal system, as they entirely disappear as the patient recovers. The symptoms of cerebral congestion from the presence of alcohol are often very severe. The delirium may be very violent, the patient very aggressive, with no conception of his condition or surroundings, and there are often delusions relating to place, the patient fancying himself in some other locality. The face is of a dusky red color, and the pulse generally very quick, and vomiting is often present. It has so happened that the majority of cases that we have personally come in contact with have been those of active arterial dilatation of vaso-motor origin, in business and professional men, due to overwork and overstrain of the brain, with symptoms of premature mental decay. There has been in all these cases an overwrought state of the nervous system, owing to excessive care, worry, or mental anxiety, combined with overwork. Dr. Russell Reynolds and Dr. Bastian speak of the final symptoms as being a condition of torpor and inactivity: "The mind becomes a blank. There is profound coma, stertorous breathing, and involuntary evacuations of both bladder and rectum. Sensibility, both general and

special, is lost, and voluntary muscular power reduced to a minimum. Convulsions may occasionally disturb the calm, or there may be fitful and momentary mutterings of unintelligible sounds; but usually in this latter stage the patient lies quietly, with labored pulse and breathing, and with flickering contractions of the muscles of the limbs until he dies."

Treatment.—Of course, the indications for treatment are to control the amount of blood existing within the cranium, by bringing to bear antagonistic agents to the congestive state. Of course, we must order prompt cessation of the prolonged study and over mental work of professional men, and rest, both for them and the overworked business man.

We must also, in cases where the congestion is due to mechanical impediments to the proper return of blood from the brain, do all in our power to keep the heart and lungs working normally. We must warn our patient to avoid great elevations and alternations of temperature, exposure to the sun's rays, alcohol, and sleeping with the head too low. Dry cupping at the back of the neck, placing the feet and hands in hot mustard water, an ice-cap to the head, ice held directly on the nape of the neck, the induction of free diuresis, unloading a packed colon, the administration of the fluid extract of ergot in ʒss to ʒj doses ter die, in combination with the bromide of sodium, Fothergill's solution of hydrobromic acid, and last, but not least, the use of cerebral electrization, as described in the chapter on electricity, are all to be used *pro re nata.*

The cautious use of stimulants is indicated when there is a feeble pulse and pale surfaces, as sometimes happens in asthenic cases. Many cases need a tonic after the first symptoms have been controlled, and there is none better in the case of overworked professional and business men than "Warburg's tincture" in ʒj doses before breakfast daily. It is disagreeable, but should be taken clear on an empty stomach. It may be taken in divided doses in capsules, to obviate the disagreeable taste. The elixir of the phosphate of iron, quinine, and strychnia is also good, or the liquor acid. phos. comp. with five-minim doses of the tincture of nux vomica before each meal, the acid to be taken after meals. The advantage of static electricity as a nerve sedative I believe to be very great, and general faradization as an excellent tonic and refreshant to the system. Persons living by the sea should seek mountain air, avoiding too high altitudes, while those living inland and in the south will be bene-

fited by a residence by the seaside during the summer months. Rest for body and mind is imperative.

2. *Cerebral Softening*—Brain-softening should be a symptom of senility, associated with a general enfeebled condition and impaired nutritive power. The general failure of cerebral power is often thus found in the aged, with rigid arteries and *arcus senilis*. It is, however, we believe, becoming, owing to the complex influences of our modern civilization, a much more frequent occurrence in business and professional men than formerly. There is a premature mental decay, the result of the combined effect of overwork, mental anxiety, and loss of rest (the brain-cells missing the proper time for their nutritive renovation, which is during sleep), which is pre-eminently an American disease, the premonitory signs of which I have seen in many comparatively young men.

Softening of the brain is aptly defined by Reynolds and Bastian as a disease characterized during life by impairment of mind, sensibility, and motility, and after death by diminished consistence and degeneration of the cerebral substance. I think that sometimes an erroneous diagnosis is made by confounding with cerebral softening, the state of brain-wasting accompanied by cerebral atrophy and hardening of brain-tissue. The seat of the morbid change is more frequently the cortex of the brain, the corpus striatum, and the optic thalamus. It has also been found in the pons, medulla, and in the cerebellum, and may be found anywhere in the brain. There is diminished consistence of the brain-tissue wherever we meet with this lesion. If the softening be due to embolism, we shall very likely find no symptoms but heart lesions, with the exception of momentary attacks of faintness. If the softening is due to arterial disease, Gowers has shown that we get mental deterioration, numbness, pains in the limbs, or slight local weakness. We may have hemiplegia and aphasia occurring in embolism, with mental deterioration. There may be apoplectic attacks, with slight loss of consciousness and the quick disappearance of the apoplectic symptoms, or there may be convulsive or delirious symptoms at the onset of cerebral softening.

There is a class of cases, illustrated by the one we are about to give, not uncommon. Mr. ——, aged 38, had had domestic trouble and grief; had been addicted to rather free use of alcohol, and gave a history of what we presume was acute cerebral congestion, the result of the combined effect of mental worry and alcohol, but which

he designated as "brain fever." Upon coming under our care we carefully examined him, and found mental dulness, loss of memory, especially for recent events, the emotional nature very easily excited, the motor power much weakened, great disinclination for mental or physical effort, headache, articulation at times rather indistinct. Sight and hearing were good, there were no symptoms of paralysis, and the reflexes were normal. Just previous to my seeing him, a small quantity of alcohol had produced a transient delirium, of which my patient had no recollection at all. He said, when I questioned him, that he was angry because one of his relatives had countermanded his order for some whiskey, but had no recollection of having drank the liquor and the state of delirium it had induced. Respecting all this his mind was a perfect blank. He would read a newspaper for an hour and be utterly unable to tell in two hours what he had been reading. Although there was this profound affection, there was great mental improvement under the influence of electrization, the chloro-phosphide of arsenic (Routh's formula), iron, and strychnia, and cod-liver oil. So much so that we discharged the patient, and he has passed the last six months in the country, living much out of doors and enjoying life very well.

I do not consider that in his case or any other, that damaged brain-tissue can ever regain its lost functional power, but we may check the progress of the disease, in some cases, by strict hygienic regulations for our patient, and by rest, together with a similar course of treatment to that I have described.

The premonitory symptoms of the apoplectic form of cerebral softening are, according to Russell Reynolds and Bastian, those of transient excitement, talkativeness, irritability, or wandering of thought, amounting to mild delirium lasting for a few minutes. He may then fall to the ground and remain partially or wholly insensible for a few moments, owing either to cerebral congestion or anæmia. Subsequently to this he may be hemiplegic and aphasic, or chronic softening may go on, the patient becoming imbecile and powerless.

The premonitory symptoms of the convulsive form and of the delirious form are stated by the same authorities to be in the former, a peculiar drowsiness, listlessness, weariness, impatience, or some flaw in memory, with distinct but momentary incapacity to understand what is said. There may be a slight hesitancy in speech, mispronunciation of a few words, a little weakness of one side, numbness, vertigo or faintness, until the convulsion occurs resembling an

epileptic convulsion and makes the grave nature of the case clear. The patient lies in a semi-comatose state and has a succession of fits, which may leave the patient hemiplegic. The prognosis in these cases is very grave. In the latter, the delirious form, which generally occurs in the aged, "the patient suddenly 'wanders' in his talk, becomes loquacious or restless, is busy in manner, exerts himself, seems tired, and falls asleep. He wakes up somewhat confused, but appears to be himself again for a few days or even weeks, when the confusion and delirium reappear, and are more persistent. There is no complete restoration, but gradually one side is found to be paralyzed, or to be slightly weaker than the other. The delirium alternates with coma, more or less profound, and the patient passes into a state like that following the apoplectic form." The final symptoms of brain softening are those of coma and death, quiet and painless.

Precocious children are said by Duparque to develop brain softening with the intellect intact, and with exaltation of the special senses and general sensibility. There is no fever, delirium, or convulsion, but after death there is distinct cerebral *ramollissement.*

Brain-softening in comparatively young men I should consider as owing to a premature failure of the proper activity of the cellular elements of the brain tissue, with very likely disease of the coats of the capillaries and small arteries, commencing with cerebral hyperæmia and subinflammatory irritation.

The cerebral softening of the aged is due generally to vascular obstruction in the brain, either arterial or capillary. Thrombosis, with vascular degeneration, and embolism, with valvular disease of the heart, are doubtless the most frequent causes of softening of the brain.

Disseminated Sclerosis of the Brain and Spinal Cord.—Syn. "Sclérose en plaques disseminées" (Charcot).—To Professor Charcot belongs the credit of first recognizing this disease, which consists in the development of patches of sclerosis of a roundish shape, and dense and hard, gray in color, looking like the gray matter of the brain. These patches, which are of varying size and shape, are scattered throughout the brain, or the brain and cord, in different localities, and more often in the brain and cord together. These patches vary in size, according to Bastian, from that of a pin's head to that of a large pea or bean in the spinal cord, while in the brain or cerebellum they may be still larger. The medulla, pons, and cerebral peduncles may be affected, and any part of the cerebrum

and cerebellum. Microscopically, there is a hyperplastic overgrowth of the neuroglia, which exists normally around and between the nerve-elements. In employing carmine staining, the new growth takes up the coloring-matter very intensely. When the lateral columns of the cord, the medulla, and the pons are affected, which are special seats of election for these patches of sclerosis, Bastian gives the following as the clinical symptoms: A slowly ensuing paresis of the lower extremities begins, first in one limb, and then, after a time, it involves the other. During this time the paresis develops into a more and more marked paralysis, though the sensibility of the limbs remains almost completely unaffected, nothing more than a temporary numbness being complained of in the majority of cases, whilst lightning-like pains and girdle sensations are altogether absent. After an interval, first one and then another upper extremity may become weak, and subsequently more or less paralyzed. During these early stages of the disease, more or less distinct remissions of symptoms may occur from time to time. Meanwhile, a most typical sign soon shows itself in the paretic or semi-paralyzed limbs, in the form of a marked trembling or shaking of those muscles or parts of a limb which are called into voluntary action with any intensity, although these phenomena immediately subside when the voluntary exertion ceases. The involuntary movements consist either of extremely well-marked tremors, like those met with in some cases of paralysis agitans, or else of movements of greater range, more resembling those of chorea. A patient lying in bed quietly, when told to sit up, will exhibit shakings and tremors in all parts of the body until he lies down again. In writing, almost every letter registers fine tremors, and in the advanced cases writing is impossible or illegible. The tendon reflexes are exaggerated, both the patellar tendon and the ankle clonus Contractions and rigidity come on late in the course of the disease. The tremors, which are rhythmical, of the head, neck, trunk, and limbs, cease when the patient is asleep, as well as when he lies quietly at rest. There is a difficulty of speech, the utterance being slow and drawling, while the lips and tongue are tremulous. There is apt to be double vision, also indistinct, hazy vision, and nystagmus (oscillations of the eyeballs) is frequently present. Vertigo of a gyratory nature, frequently impeding locomotion, exists as an early symptom. Mental failure in cases where the brain is affected is a late symptom, accompanied at times, according to Bastian, by a subacute maniacal condition, or by

delusions of wealth and grandeur, like those of paralytic dementia, or by a profound melancholia. Apoplectiform or epileptiform attacks may now occur from time to time, and death may take place in one of them. The course of the disease may be from five to ten years. When the disease affects the brain particularly and principally, vertigo, mental disturbance, nystagmus, and the "scanning" speech will be the chief symptoms, beside the rhythmical tremors. Paresis of the limbs, commencing, as we have said, in one leg, is an early symptom.

A case recently came under our notice of a gentleman of forty-two years, plethoric, a high liver, with a fair family history, who developed this disease, and who died in about three years from the time the first symptoms manifested themselves. Vertigo was the earliest symptom he complained of, and it was this that first led him to apply to a physician for relief, as he would fall down from the gyratory nature of it. The small oscillation of the eyeballs (nystagmus) was very marked. Paresis terminated in complete motor paralysis. Speech was affected. Sensibility was normal. Trembling on voluntary movement was most marked. No treatment had any effect. Electricity, strychnia, and various combinations were all tried, and all failed. The case was under the care of one of our best neurologists.

Locomotor ataxia, terminating as general paralysis of the insane, was reported by Charles K. Mills, M.D., of Philadelphia, before the American Neurological Association, June 20, 1883. Dr. Mills said that the relation between locomotor ataxia and general paralysis of the insane has been a problem of interest to neurologists and alienists since the investigations of Westphal, in 1863.

He related the following case:

P——, aged 47, at the time of coming under observation, was a man of good constitution, noted for his strength and endurance, but for three years he had not been well, during most of which time he had been treated by different physicians for "rheumatism." He was addicted to venereal excesses, and used and abused alcohol occasionally. Many years before he had had a chancre; but had not, subsequently, had any of the ordinary evidences of secondary or tertiary syphilis. He had first suffered from darting or shooting pains in his feet and legs; soon he experienced sensations of numbness and tingling in his feet, and later, in the little and ring fingers of the left hand. For a short time he was troubled with double vision, and his sight had diminished a little in acuteness.

The results of an examination made during the first week he was under observation were as follows: No paralysis was made out; galvanic and faradic irritability were well preserved. He could not walk well after dark. He swayed and tottered on trying to

stand with his heels together, or with his eyes shut; and he could barely manage to stagger a few steps with his eyes closed.

Paroxysms of sharp, sudden pain in the limbs were more frequent. He was awkward with his hands in dressing. A peculiar sense of constriction or drawing in the lower part of the abdomen had annoyed him for several months; sexual desire had diminished. He had no delusions, and was fully able to attend to his business, which required a large amount of physical and mental exertion.

Under the use of nitrate of silver, galvanization of the spine, and faradization of the extremities, continued for several months, he improved remarkably; but, after remaining better for a few months, he again relapsed, and now he got steadily worse. Occasionally, however, he would temporarily improve. The anæsthesia of his feet and hands deepened; the staggering gait returned and grew worse; every two or three weeks he would have frightful attacks of lancinating pains.

Decided mental symptoms first began to make their appearance two years after first coming under treatment. He spent his money very freely upon others, as well as upon himself. His ideas became queer and lofty; but the delirium of grandeur did not develop thoroughly until nearly a year later, when he began to talk and act in the most preposterous manner. About the same time a peculiar stagger in his speech, a slight twisting of the mouth to one side, and some tremor of the tongue and lips became noticeable when he talked.

Nearly three years after the notes first made, and almost six years after the development of ataxic pains, he was sent to the insane department of the Pennsylvania Hospital, where Dr. Mills occasionally visited him.

His delirium became of the wildest character, and he became irritable and hard to manage. Anæsthesia and tremor of tongue increased.

On two occasions he had slight apoplectiform attacks, once accompanied by a slight spasm.

Later he was removed to the State Hospital for the Insane at Danville, Pennsylvania, where he remained until his death, which occurred five years and four months after first coming under care of Dr. Mills, and about eight years after he was first affected with ataxic pains. A post-mortem examination of the brain and spinal cord was made. The pia mater over both cerebral hemispheres, particularly in the postero-frontal and parieto-temporal regions, was opaque, congested, and adherent at points; decortication being marked. Convolutions were atrophied. The pia mater of the cerebellum, especially over the superior vermiform process, was deeply congested and adherent. The pia mater of the spinal cord was thickened, and the cord presented an irregularly shrunken appearance.

Microscopic examination showed marked sclerosis of the posterior columns of the spinal cord throughout its whole extent, and that inflammation and thickening of the pia mater were also present everywhere. The sclerosis was most pronounced in the lumbar region, decreasing in intensity as the cord was ascended; but it was well-marked throughout, both in the columns of Goll and in the posterior root zones.

The medulla oblongata on one side was much sclerosed, and slightly so on the other. Sclerosis was also present in the pons, crura, optic thalami, and convolutions examined, and in the cerebellum. The pathological appearance shown by the microscope corresponded closely to those mentioned by Westphal as occurring in the spinal cord in dementia paralytica. According to him, the posterior columns show few or no sections of nerve fibres, and their place is taken by a connective tissue substance. In the cervical region Goll's cuneiform columns are especially affected; in the dorsal and lumbar regions,

however, the entire area of the posterior columns is involved. In fresh preparations, numerous granular fat-cells and corpora amylacea are found.

In this case the spinal symptoms were the first to appear. Three years before coming under the care of Dr. Mills he began to suffer with the lancinating pains of posterior sclerosis. Although when first seen by him, and until he improved under treatment, he suffered at times from mental anxiety and sleeplessness, apparently the result of the pain and other distressing symptoms of the ataxia, no typical mental symptoms appeared until more than two years later, and more than five years after the appearance of the first symptom of spinal trouble.

Dr. Mills referred to the views of various authorities with reference to the relation of locomotor ataxia and general paralysis of the insane. According to Westphal, with whom Hammond agrees, no direct relation exists between the morbid process in the cord in posterior spinal sclerosis, and that in the brain in general paralysis of the insane. According to these authorities neither disease is secondary to the other. They simply coexist as the expression of an excessive proclivity to diseases of the nervous system, just as any other two diseases may be present, one in the brain and the other in the cord, without there being any direct interdependence between them. Locomotor ataxia is by no means uncommon in patients affected with the other forms of insanity.

Hamilton (*New York Medical Record*, July 29, 1876), discusses the relation of these two affections. Leidesorf has related one case in which general paralysis was preceded by spinal symptoms. Maudsley speaks of other cases. Calmiel says that, in many cases, the changes proceed from the cord upward, and Baillarger indorses his views. Charcot has proved, very conclusively, that disseminated sclerosis can exhibit all the symptoms of general paralysis of the insane.

Cases reported by Obersteine, Hamilton, Plaxsen, Mickle, and others, were also referred to.

CHAPTER XXX.

ELECTRICITY IN DISEASES OF THE NERVOUS SYSTEM.

We have three kinds of electricity at our disposal in the treatment of nervous and mental diseases,—the constant or galvanic current, the induced or faradic current, and static electricity. In the former, the constant current, we have a means more powerful than any other of modifying the nutritive conditions of the central nervous system. It possesses great efficiency to antagonize the various congestive states of the brain in nervous and mental disorders, and in incipient insanity. By its use we are enabled to secure a proper tonic contraction to cerebral bloodvessels habitually dilated, and we can also antagonize by its use the symptoms of failing memory, weakened power of attention, and vertiginous sensations, if we use it daily for

some time to the head, avoiding injuriously strong currents. The gravest disorders of the nervous system commence often with hyperæmia of the brain and cord, which ends in psychical disorders of varied nature, and this hyperæmia we can effectually remove by the application of the constant current to the brain. Grave brain exhaustion and the mental and nervous debility of overworked business and professional men will yield rapidly to electricity in this form and to centric galvanization, using the negative electrode at the pit of the stomach while the positive pole is applied to the crown of the head or cranial centre, the cervical sympathetic nerve on each side of the neck in front of the sterno-cleido-mastoid muscle, and on either side of the sixth and seventh cervical vertebræ.

It is but a short time since I discharged from treatment, completely cured, a young merchant of New York, who was in the incipient stage of insanity. The bloodvessels of the dura mater, the pia mater, and of the brain itself, I considered in this case to be probably habitually dilated, causing marked congestion or hyperæmia, and the indications for treatment were to secure a tonic contraction of these vessels. I used a galvanic battery with clock machinery attached to it—a balance clock—the isochronous beats of which establish and interrupt the communication between the poles at intervals of fifteen seconds. The galvanic current, when slowly interrupted in this way, produces a more energetic contraction of the cerebral bloodvessels than when it is not interrupted. The positive pole I placed at the level of the first cervical vertebra, and the negative pole at the level of the superior ganglia of each of the cervical sympathetic nerves in turn. The sittings lasted five minutes each time. Beyond this electrization of the brain I did nothing beyond prescribing a course of warm baths at bedtime, with a dose of thirty grains of sodium bromide and thirty drops of cannabis indica in half a glass of water after the bath, and friction with flesh gloves over the whole surface of the body. In the inception of treatment I also cleared out the system by a mercurial cathartic, followed by salines, which is an excellent preparatory method of treatment in the incipient stages of mental disorder. Each seance produced a marked and immediate amelioration, lasting longer and longer each time, and my patient described a sense of weight as lifting from the vertical region of the head, at which point he had persistent headache, which had lasted for months.

I could recount many similar cases, if necessary, but the above is

a typical one, in which we find our patient restless, sleepless, and with eyes suffused and conjunctiva congested, and confusion of mind. The grave cases of neurasthenia, associated with cerebral hyperæmia, exhibit impaired nutrition and assimilation, impaired intellection, melancholia, mental depression, muscular atonicity, irritability, and inability to bear stimulants without distress in the head. These patients exhibit morbid psychical symptoms and get up a religious melancholy,—if naturally of religious tendencies,—and there is often a change in the sentiment. In female patients there is menstrual suppression, but local treatment is not called for here, as electricity and the proper constitutional treatment will cure the patient. Sleeplessness, perspiration, and a loss of the elasticity of the skin are all present in these cases.

Professor Roberts Bartholow speaks thus respecting the influence of the galvanic or constant current in affecting the brain and cord: "Galvanism can alone be used to affect the condition of the brain and spinal cord. Faradism does not pass the barrier of the bony envelope of these parts, but galvanism has been experimentally shown to do so. That galvanism and not faradism should be used when it is proposed to reach these parts, seems therefore conclusive. There can be little question that galvanism is highly serviceable in certain vascular states of the intracranial organs. We must bear in mind how galvanism affects the vessels in order to apply it correctly. We possess no agents which can act on the contractility of the vessels with the promptness and efficiency of galvanism."

By securing a proper tonic contraction to cerebral bloodvessels habitually dilated, we ward off mental disease in a great many instances. We should, I think, use the positive pole of the constant current at the level of the first cervical vertebra, and the negative pole at the level of the superior ganglia of one of the cervical sympathetic nerves. The current should be frequently interrupted, for experiments show that vascular contraction is produced most markedly at the opening and closing of the circuit. The number of cells employed must vary with the constitutional susceptibility of individuals. Other therapeutical applications of the constant current are used to suit different symptoms in different cases.

The experiments of Ch. Latournian, of France, on the application of the galvanic current to the brain and its membranes are very conclusive and easy to verify. A kitten is taken about one month old, in which the cranial wall is still very thin and easy to cut, and a por-

tion on the left side is cut out, exposing the dura mater. It will then be very easy to see with the naked eye, or with a magnifying glass, the arterial and venous branches which ramify upon the surface. The positive pole of the galvanic current is then to be placed behind the right ascending ramus of the inferior maxilla, and the negative pole upon the anterior cranial region, above the eyes. Twelve seconds after the closing of the circuit the periarterial branchings of the dura mater become less and less visible, and a little later the venous branches themselves become pale. At each interruption of the current the anæmia increases for an instant and then the vessels grow a little larger. This experiment can be repeated as often as necessary, and will always give the same results. The dura mater may then be cut out and the pia mater exposed, when its vascular branches—arterial and venous—will be visible upon the gray ground of the cerebral substance. The same observations may be made on it as on the dura mater, and with the same results, of obtaining at will a contraction of the cerebral vessels.

The therapeutic value and practical bearing of these facts, as applied to diseases of the nervous system and to psychological medicine, are immense. About the only medicines that we need to employ with cephalic electrization, are the sodium bromide and cannabis indica mixture, referred to before in this volume, which I claim is the most valuable combination to soothe and tranquillize the cerebral nervous system that the general practitioner possesses in the incipient stages of insanity, and very many cases might be cured in their own homes without ever going to an asylum by this treatment, conjoined with perfect rest. 30 grains of bromide of sodium, and 30 minims of a reliable tincture of cannabis indica, thrice daily, in water, is the minimum dose, while the maximum dose is 60 grains of the sodium bromide and 60 drops of the tincture of cannabis indica; while to prevent brain-wasting, and as a general tonic to the exhausted nervous system, Routh's formula of the chloro-phosphide of arsenic, commencing with 5-minim doses and gradually *decreasing*, is an excellent adjunct. The value of arsenic as a nerve-tonic of great efficacy is not thoroughly appreciated by the profession at large. The subject of the electro-therapeutics of the diseases of the nervous system is full of interest. The constant current is extremely useful in antagonizing pain, and is sedative, restorative, and refreshing in its action. I have found it of the greatest use in neuralgia of the solar plexus, the cardiac plexus, in gastrodynia, and in ovarian neu-

ralgia. I always put the electrode of the positive pole over the seat of pain, and the negative either on the spinal cord or at some indifferent spot. I have seen ovarian neuralgia of extreme intensity, which had resisted any safe amount of morphia and atropia hypodermically, give way to the galvanic current when a current from thirty-two cells was applied locally to the abdominal region. Centric galvanization, which affects the brain, spinal cord, and cervical sympathetic and pneumogastric nerves, gives us the most powerful tonic and reconstituent means at our command over the whole central nervous system; while, to promote greater activity in the nutritive functions generally, we can, by the proper and judicious use of the faradic current of electricity, exercise all of the muscles of the body daily and improve nutrition very markedly. The galvanic current, however, possesses much more power over the nutrition of organs and tissues, owing to its action on the circulation. In the amyotrophic paralysis from disease of the anterior cornua of the spinal cord, where the muscles waste very rapidly, if we do not arrest the trophic degeneration, we shall find very probably the reactions of degeneration, so that there is no contractility of the paralyzed muscles, as in infantile paralysis, to the induced or faradic current. The galvanic current, both in these cases and also in facial paralysis, will cause movements of the muscles, and we have to use this current, therefore, until the contractility of the faradic current is restored, and until the muscles have recovered their normal volume and contractility. In hemiplegia, if electro-contractility is not lost and the muscles not wasted, electricity need not be used at all. In paraplegia, if the lesion is above the dorso-lumbar enlargement of the cord, electro-contractility is preserved; if the lesion is at the nerve-centres, or the dorso-lumbar enlargement, we get the reactions of degeneration and loss of electro-contractility, and must then use slow interruption of the galvanic current. In the treatment of sciatica, in common with other neuralgias, it is important to bear in mind that pathological causes which irritate the nerve high up in the trunk, produce pain at the peripheric distribution, and sensations excited by irritation of the origin or nucleus of a sensory nerve are uniformly referred to the periphery. The great predisposing cause of sciatica, in common with the other neuralgias, is hereditary predisposition, which results in the transmission of an imperfect nervous system,—a neurotic constitution. Sciatica is one of the most curable of neuralgias, if properly treated. If injudiciously treated, it is often very

intractable. We have as forms of sciatica, aside from a simple neuralgia, syphilitic and rheumatic forms of the disease, the former occurring very frequently; and in obstinate cases, which have resisted all other treatment, we may get brilliant cures by giving iodide of potassium in combination with small doses of bichloride of mercury. The irritation set up by obstinate constipation, the puerperal state, where the enlarged uterus produces an irritative pressure, or a tumor pressing on the nerves in the pelvis, may all cause sciatica. The worst cases we meet with in practice occur between forty and fifty years of age. Primarily, *rest* is the great therapeutic agent. Our patient must not be allowed to walk, as muscular movements are very injurious, as the nerve is pulled upon by the muscles and the pain thus aggravated. The patient must also be kept warm, and wear silk drawers if he can afford silk underclothing, and the bowels kept carefully regulated. When the paroxysms of pain come, we may alleviate them temporarily by hypodermics of morphia and atropia, and we may paralyze the sensibility of the peripheral nerves by local application of aconite liniment or cyanide of potassium, as spoken of in the chapter on neuralgia. The use of the constant current of electricity, by its stimulating and catalytic effects, will enable us to get that perfect cure which should be our aim. The negative pole of a battery of thirty-two cells should be placed opposite the roots of the nerves which form the sciatic, and the positive pole is applied at the seat of pain. I make this application twice daily, and, by keeping up the nutrition of the central nervous system at the same time, I obtain the most gratifying results even in cases of years' standing. The nutrition of the sciatic nerve is much improved, and there is a healthy change induced in the entire nerve. I have also cured some cases of sciatica by static electricity, using the Touplar or improved Holtz machine, charging the patient, and then drawing powerful sparks along the course of the affected nerve by the wire brush or other electrode. If we wish to be successful with static electricity, we must have great tension and quantity. In severe lumbago, affecting the dorsal muscles and the intercostals, with severe, excruciating pains, making the patient bend almost double, I have experienced uniformly good results in every case from the use of the constant current to the affected region, together with slight ether inhalations. We certainly get a specific effect from the use of the constant current in nearly all the neuralgias, and static electricity from a good machine will, from the stimulating effects of

a thick spark on the deep tissues, also give good results. In facial neuralgia the constant current is very useful. In paralysis from brain disease, particularly in hemiplegic cases where we find absence of any decided mental disturbance, slight thickness of speech, more or less deviation of the tip of the tongue to the paralyzed side when it is protruded, partial and incomplete paralysis of the facial muscles on the side on which the paralysis of the limbs exists, more or less complete loss of voluntary power over the left arm and leg, if the lesion is in or near the right corpus striatum, loss of sensibility and numbness on the paralyzed half of the body, and slight elevation of temperature on the paralyzed side, *if the contractility of the muscles be perfect, the use of electricity is contraindicated.*

When, in paralysis, we meet with the reactions of degeneration, wasting of muscles, or loss of normal muscular irritability or contractility, the galvanic or constant current is then indicated, and after we get by this current an irritability which responds to the induced or faradic current, we may proceed with that current to the ultimate restoration or cure of the paralysis. In hysterical paralysis, where the patient has no *will* to move her muscles, we may get a rapid and brilliant cure by the induced current, or by static electricity. In neuralgia or hyperæsthesia of the testes, which is a very painful neurosis, we have a perfect means of relief in the constant current of electricity, conjoined with laxatives, followed by tonics.

In hyperæsthesia or irritable state of the uterus, a very troublesome neurosis, we apply a cup-shaped electrode, attached to the negative pole, to the os uteri, and the positive to the hypogastric or sacral region, with uniform good results. A very good local sedative consists of ℥j of morphia to ℥j of unguentum belladonnæ, and a little pill of this rolled up and introduced into the os. This is also a very valuable remedy in hysteria. The patient can hardly sit down, and coition is impossible in true hyperæsthesia of the uterus. It results, I think, from neurasthenia.

Nervous cardiac pain near the apex of the heart is a common and distressing neurosis, and this cardiac irritability is alleviated by centric galvanization. This form of application also relieves neuralgia or hyperæsthesia of the stomach, in which the vasomotor nerves and the tone of the arteries are impaired. Spinal hyperæsthesia is also very amenable to treatment by the constant current. We always find that neurotic pains of the spine are, as a rule, much more severe than those accompanying serious organic trouble. Neuralgia

or hyperæsthesia of the breast in women is readily cured by the judicious use of the constant current.

In cerebrasthenia or nervous prostration, we have a hyperæsthesia or neuralgia of the entire brain. This condition may lead to insanity if not checked, and cephalic electrization is our most important therapeutic measure. The brain is enfeebled and hyperæsthetic, and the daily use of cephalic electrization will soon improve its nutrition and tone, and we shall cure our patient. In all cases we must build up and improve the nutrition of the central sensory nerve-cells, as it is this condition of imperfect nutrition which causes neuralgia and hyperæsthesia. In the early stage of progressive or general paralysis, we may sometimes gain great benefit from centric galvanization, and cut off the wearing impressions which are transmitted practically, without cessation, to the brain.

In using electricity, we should remember, in contracted muscles, to apply the faradic current to the antagonistic or extensor muscles, and use the galvanic current to the flexor muscles. In this way we may successfully treat the late rigidity of hemiplegia.

In infantile paralysis, the electro-contractility is diminished, the muscles waste and undergo fatty degeneration, and are affected by secondary contractures. They will not react to the faradic current, but will to the interrupted galvanic current, and are very sensitive to it, therefore we must first use this and afterwards the faradic current. As long as there is response to the faradic current, we should use it in preference. We must not use electricity too soon in paralysis from cerebral disease, and the same remark applies to strychnia.

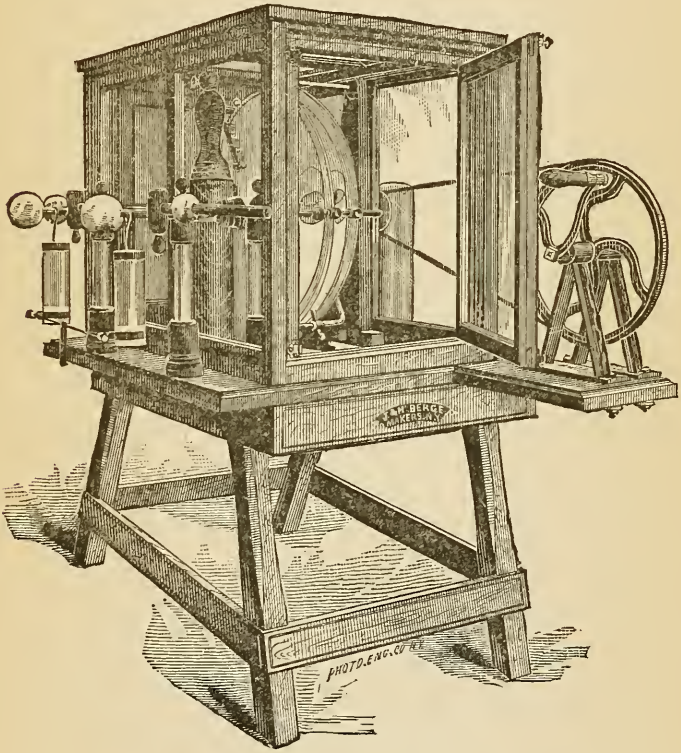
As I have previously stated, the amount of contractility will show us how much good electricity will do. If it is normal, electricity will do no good; while if the electro-contractility is markedly impaired, much good may be done by it. In all cases we may improve the nutrition of the muscular system. As a general rule, we must treat the muscles by the current to which they will most readily respond. In paraplegia from myelitis, meningitis, or hæmorrhage into the cord, electricity must not be used while the active lesion exists. We may then—after the active lesion has subsided—use the interrupted constant current until the farado-contractility is restored, and the faradic current, or both combined. In gunshot wounds and injuries of nerves, followed by paralysis, faradization is invaluable. In local paralysis from cold, or lead-poisoning, we use

the interrupted galvanic current, and subsequently the two forms combined. Galvanism is also very useful in atonic dyspepsia, writer's cramp, muscular atrophy, spinal irritation, aphonia, insomnia, diphtheritic paralysis, locomotor ataxia, paralysis agitans, myalgia, impotence, epileptiform neuralgia, torticollis, etc.

The good effects of electricity in nervous diseases is readily understood when we reflect upon the influence of the sympathetic or ganglionic nervous system on the vascular system, and secondarily on blood, nutrition, and secretion, and also its influence on thoracic, abdominal, and pelvic viscera, except the vascular system.

When the cervical sympathetic is galvanized in the neck, the pupil dilates and there is contraction of the bloodvessels of the corresponding side of the head, and a diminution of the temperature, if this had previously been raised by section of the nerve. There is diminished supply of blood, and diminished temperature. By the use of electricity we affect the circulation very powerfully, as it is under the control of the central nervous system, which we act directly upon by the electric current in two ways, first, through the vasomotor nerves, and second, through the cardiac branches of the sympathetic and pneumogastric nerves; we also influence powerfully the excitability and vitality of the parts owing to the control which the sympathetic, through its vasomotor action, has over these processes. The action of electricity over the abdominal and pelvic viscera is through its action on the branches of the sympathetic distributed to the secreting organs to regulate the supply of blood, and control their activity, while for the intestines and genito-urinary apparatus, it stimulates peristaltic action or simple contraction. By galvanization of the solar plexus we can effect peristaltic movements of the large intestines. I think that galvanism may, as it is used mildly or energetically, either exalt or depress the functions of the nervous centre on which it acts. I cannot explain the reason of this, unless it depends upon the ganglionic centres through which the electricity, analogous to nervous force, passes before it reaches the final distribution of the nerves to the contractile or secreting elements. Charcot considers that static electricity is very useful in hysterical and hystero-epileptic cases, in peripheric facial paralysis, paralysis agitans, spinal irritation, dyspepsia and dysmenorrhœa; cutaneous anæsthesia, the numbness and anæsthesia of hemiplegia, paraplegia, neuralgia, and rheumatic affections, are also favorably influenced by the stimulation of the peripheral nerves by the electric spark, spray, or electric wind of the im-

proved Holtz machine. We also get sedative and tonic effects from static electricity. We can also get muscular contraction with less pain with the induced current. We insulate our patient by placing him on an insulated platform, which is connected with one pole of the machine, and then either treat him by insulation alone for the simple tonic effect on the whole nervous system, or we "draw" sparks by an electrode attached to an earth connection. The electrodes are balls of metal or wood for the spark, the electric brush for the electric "spray," or a metallic sharp point for the electric "wind," all on glass handles. We use, in our private hospital, for nervous and mental diseases a large improved Holtz machine with great success, a cut of which we give, and cordially recommend it to the profession.



The faradic or induced current of electricity is, when used as general faradization, a general muscular and nerve tonic. It should never be used sufficiently strong to be disagreeable to the patient. I apply the negative pole to the coccyx, and then apply the positive pole,

using a sponge electrode, to the top of the head or "cranial centre," to the cervical sympathetic nerve in the neck, and on each side of the sixth and seventh cervical vertebræ, and finally up and down the spine. I also, in nervous exhaustion of women, have the entire surface of the body rubbed with the positive pole to which is attached a broad sponge electrode, by an experienced nurse, so as to exercise the fibrillæ of each individual muscle, an electro-massage.

Respecting the clinical uses and forms of electricity, Dr. J. Russell Reynolds, F.R.S., Professor of the Principles and Practice of Medicine in University College, says:

With regard to *treatment* by electricity, I have a few general remarks to make. You can sometimes actually and immediately cure a patient. There are cases in which the only symptom that may be presented to you—I do not say the whole morbid condition, but the only symptom—is loss of voice. Sometimes one single application of electricity will remove it completely, and in that instance you do apparently cure the patient. There are other diseases which you cannot be said to cure, but which you may relieve by electricity. By its application you may, in many instances, again and again, relieve pain; you may, in like manner, relieve spasm; or you may slowly diminish, and even ultimately remove, paralysis. In these cases you assist, by electricity, the processes which lead to the removal of the pain, paralysis, or spasm; you put the patient, by electrical appliances, into a better position to improve, or be cured by the agencies of food, medicines, rest, and time. Lastly, there is a group of cases in which, though you cannot cure or even relieve the symptoms, you may yet arrest the progress of disease. Sometimes, for example, in a child with so-called "essential paralysis," you may prevent deformity, though you cannot cure the paralysis. In certain cases of lead-poisoning, muscular atrophy, etc., although you cannot recall the muscular substance, you may prevent the atrophy from increasing.

I think it is necessary for me to say a few words as briefly as possible, about the several forms of electricity which are now in common clinical use. You constantly hear of "faradization," "electrification," "galvanism," and so on; of "battery-current," "continuous current," and the like; and it is probable that some of you may not have perfectly clear ideas as to the meaning of these terms, or, at any rate, ideas which are precisely the same as mine, and I should like us to have a common starting-point, in a clear comprehension of the meaning of the words we use.

(*a*) Many years ago, it was the therapeutic fashion to put the legs of patients into buckets of torpedoes, or electric eels; but this practice has become obsolete, and there are now only three forms of electrical appliance in common clinical use. One is that of the old-fashioned "electrical machine," either a cylinder or plate of glass, which, by friction, produces a certain amount of electrical disturbance, one of the results of which you collect on an insulated piece of brass called a "prime conductor." This is the oldest mode of applying electricity which is now in force in our hospitals. In the present day it is sometimes called "static" electricity; and in speaking of the use of static electricity, what is meant is that the person is charged, like that "prime conductor," with electricity of that particular kind. It has also been called "frictional" electricity, from the mode of its production; and also "Franklinic" electricity, or "Franklinism," in memory of the individual who—I will not say discovered it, but who—made out more about it than any one else at the time that he worked at the subject.

1. There are three modes in which that electricity is applied. One is simply to make the patient, as it were, a part of the prime conductor, and charge him full of electricity. You insulate your patient by placing him upon a glass-legged stool, taking care that he is not in contact with any conducting substance; then you connect him by a brass chain, by his own hand, or by any other mode you like, with the prime conductor; you set the machine in action, and fill him full of electricity, do nothing more. That is the simplest mode of applying static electricity. In certain diseases it is curious what this will do, without putting the patient to the least discomfort. Probably the only thing he will be conscious of is that his hair seems to be "standing on end;" this is neither painful nor even uncomfortable, but it is wonderful how much that simple "charging" a patient will effect in some forms of disease. I have known it absolutely remove, in a few seconds, a "tic" that had lasted for days. Pain in the sciatic nerve, many odd and disagreeable sensations, unpleasant flutterings about the heart, depending on weak innervation, and tremor of the limbs, may all be removed by simply "charging" the patient.

2. Another mode of using this Franklinic electricity is to apply a "spark" to a particular part. You may have a movable, insulated brass knob in connection with a prime conductor, and you direct it to the larynx, or some other part, and let the spark go into the skin. Or you may put the patient on a glass-legged stool, and charge him or her in the way I have described, and take a spark out of the larynx or the limb with your knuckle or with a rounded knob. In some cases of aphonia, where the aphonia depends on a special condition, you may insulate the patient and charge him with electricity without the slightest benefit; but take a spark out of the larynx, or put a spark in,—whether positive or negative, it matters not,—and that particular condition of aphonia may be cured directly. This I have known to occur when much more painful processes of electrification had been previously tried, and without effect.

3. A third mode of using Franklinic electricity is that of sending the shock from a charged "Leyden phial" through the part that you wish to affect. This has occasionally produced curative results when other modes have failed; and it is in obstinate nervous aphonia that its influence has been the most distinctly seen. But, short of being hanged, I do not imagine that anything could be much more pleasant.

(*b*) The next form is what has been called galvanism. It is the form of which one hears so much, in the present day, under the name of the "continuous current," or "battery current," or, as it has been sometimes called, with a Hibernian misuse of words, the "interrupted continuous current." By all these terms is meant that form of electricity which is developed by chemical decomposition. The particular form of battery does not matter, so far as the quality of the electricity is concerned. Wherever you have chemical decomposition in progress, there also is some electrical change going on; and the only object a medical electrician has, in choosing any particular form of battery, is to catch the electricity as best he may. This form of electricity is characterized by the following features: It is of low "intensity," so far as regards its action upon nerve and muscle, but it is in considerable "quantity," and it produces "chemical" results, and results on temperature, "thermic" results, that are not approximated by the Franklinic electricity.

I am not now going to describe to you the batteries, of which there are numberless kinds. The choice among them is guided chiefly by considerations of cheapness, portability, the ease with which the machine can be kept continuously in order, the bulk of the battery, and the readiness with which its strength of action can be regulated. What you want is a current that shall play evenly, and at a measurable strength, for a certain length of time. It is convenient to have a battery that is portable, and it is a great point to have one that does not require everlasting looking after. The battery in our electrical room in this hospital (Elliott's) is not portable, but the majority of our patients are; it will act

very steadily for three or four months; it is tolerably cheap; it can be very readily put in working order by a person who does not need a great amount of electrical skill; and you can easily regulate the strength of the current you employ.

1. There are two modes in which this kind of electricity, or galvanism, is used. In one of them the current is "continuous," in the other it is not. A really *continuous* current may be passed through the body, or part of the body; and this is accomplished by introducing the whole or a portion of the human body into the circle of the battery, and then letting the current play through it. This will do the following things: it will relieve spasm of certain kinds; it will relieve pain of certain kinds, and this sometimes in a few seconds, and the effect is as obvious and distinct as is that following the administration of an emetic. A person may have a particular kind of headache; you pass a continuous current, as it appears, through his head, and sometimes in a few seconds the pain is gone. It will also remove some forms of tremor and of spasm.

I want you to bear in mind certain points respecting the effects of the continuous current upon the limbs, according to the direction in which it is passed through those limbs. Supposing I have the positive end of the battery connected with a person's left hand, and the negative end connected with his right, the current, passing from the positive to the negative pole, goes up the person's left arm to the trunk of the body, and down the right arm to the machine again. The current passing up the arm has been called the "inverse," and that coming down the arm has been called the "direct." In the arm in which the current is passing upwards the "irritability" of the muscle and nerve is gradually increased; in the other arm, in which the current is passing downwards, the irritability is gradually diminished. You may test this fact by now and then breaking and remaking the continuous current; and you will find that in the two arms two different degrees of irritability exist, according to the direction in which the current had been passing, whether up or down. One arm will act more, the other less readily than in health. The difference thus produced between them is sometimes highly marked.

It may occur to you to ask, "If that be the case, which current should I use to relieve pain and spasm, the direct or the inverse?" All I have to say is, that so far as I have seen, it does not make the smallest difference. Theoretically it should make a very great difference, but practically it makes none. I have seen pain or spasm relieved as well by the current in one direction as in the other, and this whether the spasm has been clonic or tonic, or whether there has been merely tremor.

The continuous current, when weak, produces little or no pain. The patient feels nothing, or next to nothing. If it be strong, he feels a tingling or burning at the points of contact, and a sensation of tightness and tension in the part, between the points of contact, that is very disagreeable, or, indeed, intolerable.

2. Another mode of using the battery current is by *interrupting* it—making it not continuous. This may be done in various ways. You may take the two sponges attached by wires to the two ends of the battery, place one sponge on the upper part of the man's leg, and interrupt the current by occasionally dabbing the other sponge on the leg at a more or less distant point. By that means you "make" and "break" the current. Or you may have a simple piece of apparatus attached to the battery,—a cogged wheel, with alternating conducting and non-conducting materials; which wheel can be rotated, and so interrupt the current, while the sponges are maintained in place. Or you may use a little vibrating wire, which makes and breaks contact rapidly, as in one of Pulvermacher's interruptors. In thus applying the battery current you will notice this further fact, namely, that the "direct" application produces more obvious effects upon the muscles (*i. e.*, induces a more marked contraction) than does the "inverse" or "indirect." You will find, for example, that an interrupted batterry current,—say of ten cells,—which, when

sent *down* the arm produces distinct contraction of the muscles, may elicit no contraction, or very much less contraction, when it is sent *up* the arm in the opposite direction. It is important to bear this in mind when thus using galvanism for the purposes of either diagnosis or treatment, as I shall hereafter show you.

(*c*) The third form of electricity is "faradization," or "faradism." It has also been called "induced" electricity, "magneto-electric," "voltao-magnetic," "voltao-dynamic." When you hear used any one of these words, you will understand by them that particular kind of electricity of which Faraday was the great exponent. It is electricity of very high tension, and resembles more closely Franklinic electricity than it does the galvanic current. The chemical action of faradization is almost *nil;* the direct effect on temperature is almost *nil;* it causes no burning feeling, no sensation of heat, like that which is communicated by the galvanic current; but, under ordinary circumstances, it produces marked contraction of the muscles, and a powerful action on the nerves of both motion and sensation. It is an "induced" current, and is of momentary existence only; but these momentary currents may be repeated slowly or repeated quickly. It exists only at the moment of making or breaking the galvanic current, or at the moment of making or unmaking a magnetic condition in a piece of metal; but it may be made or broken so rapidly that you may pass very many currents in a second of time in both directions. Remember, lastly, that, though it is of momentary duration, it is of very high tension.

There are two terms used commonly about it, and which you may see on batteries of various kinds—"primary" and "secondary." It is for clinical purposes an almost useless distinction. The difference between the two has been said by some to be this,—that the primary will have a more distinct action upon one set of nerves, and the secondary upon another. But the most marked physiological difference that can be made out between them is that the secondary is of greater intensity than the primary, and will sometimes proceed more deeply into the parts you wish to affect. It is an unhappy use of the word "primary," for the current so named is not a primary current in the sense of being a battery current; it is essentially an induced current. The other is an induction from an induction, and is "secondarily" induced, and the clinical difference between them is mainly one of intensity. If, then, you apply the terms "primary" and "secondary" to faradization currents, remember that you should mean by *each* of them "induced."

[There are three elements to consider when speaking of the modification of electric sensibility—namely, the skin, the muscles, and the nerve trunks.]

1. In health, the application of electricity to the skin is accompanied by sensation varying, in kind and degree, in relation to the form and the force of the agent employed. Franklinic electricity, when used in the form of sparks, produces a stinging sensation in the skin, which is painful to some people, but not altogether unpleasant to others. The continuous galvanic current produces two sensations: one, a feeling of burning, which is intense in proportion to the force that is employed, and which is especially felt at the point of contact of the positive pole; the other, a sense of tension and thrill between the poles. Faradization gives rise to a feeling of stinging or burning, in proportion to the intensity of the induction, the rapidity of the interruption, and the dryness of the conductors.

In disease the electric reactions of the skin may be much changed. The patient may exhibit an increase, a diminution, or an entire absence of sensibility.

(*a*) Increase of sensitiveness is found in many simply "nervous" people, whose sensations are all, more or less, exaggerated. In them, too, you may observe much of the hysterical character, and sometimes it is obvious that the increase of sensibility is due to a central—*i. e.*, to a mental and moral—state, rather to any peripheral change. But occasionally you find that the skin of one limb is more sensitive than that of its fellow,

and usually that this increase is associated with augmented sensibility of the muscles to electric action. The diagnostic value of this change is identical with that of increased electric contractility, so far as the nature of the lesion is concerned, but it may differ from it in regard of the precise locality of change.

(*b*) Diminution of cutaneous sensibility to electricity is met with when there is the condition of "shock" which accompanies recent and suddenly induced paralysis; and at the same time there is, commonly, loss of tactile sense and of the power of appreciating cold and heat. It is also found in some cases of hysteria, apart from any paralysis or other change of motility; and it may exist, as a chronic symptom, in some very rare cases of central disease.

2. When the muscles are put into action by electricity the healthy individual feels their contraction. If the force employed be of low tension, and only slowly interrupted, the sensation is not unpleasant; but if the current be of high tension, or be very rapidly made and broken, the feeling in the muscles amounts to pain, and, indeed, to very severe pain, of cramp-like character. In health the amount of sensation is in direct proportion to the force of the contraction; but in disease this relation does not always persist; and, moreover, there are certain states of the nervous system in which both contraction and sensation are together morbidly exaggerated or depressed.

(*a*) Increased electro-muscular sensibility sometimes exists alone. I have found it in the trunk, or in all the limbs, or in only one of them, apart from any general or local increase of contractility. Patients sometimes feel, and feel painfully, an amount of muscular contraction which they would scarcely recognize in health; and this painfulness of muscular movement may be either general or local. It is usually dependent on change in the central nervous system, is accompanied by increased cutaneous sensibility, often by neuralgia, and by other modifications of sensation—pseudæsthesia, or dysæsthesia—which are sometimes erroneously termed hyperæsthesia.

The electro-muscular sensibility may be augmented, *pari passu* with the increase of contractility. In such circumstances the muscles act more energetically, and the patient feels that action more acutely than he should do in health. Sometimes this condition is general, and then the only comparison that can be made is between the patient and the average of other men. But when the increase is local, as indeed it often is, the limbs of one side may be contrasted with those of the other. The diagnostic value of such increase is the same in kind as that which I have already described to you when speaking of augmented contractility.

(*b*) The sensibility of the muscles is usually diminished when their contractility is reduced; and this diminution is commonly in direct proportion to that reduction—as, for example, in lead-paralysis. But sometimes there is other than this parallel deviation of the two functions from their healthy standard. We meet with cases in which the contractility persists, but in which the sensibility is diminished or extinguished. The muscles act well, but the patient does not feel their action. This peculiar relationship is observed in some cases of hysterical paralysis, but I have also found it in individuals who had exhibited none of the ordinary features of hysteria. On the other hand, it has been found that in rare cases of lead-poisoning the sensibility has remained intact when the contractility has been diminished. When contractility as well as muscular and cutaneous sensibility are all diminished in a limb, or in one-half of the body, the condition is one either of "shock," or of extensive cerebro-spinal lesion; the time during which the symptoms have lasted, and the mode of their onset, will enable you to diagnosticate between them.

3. The nerve trunks appear to be so involved in certain electric applications that sundry sensations arise from their irritation. When the poles of a galvanic battery are ap-

plied to the skin in close proximity to one another the nerve-trunks may escape; but when they are widely separated some nerve-trunks may be involved in the circuit; and then, with the continuous current, there is, in proportion to its strength, a feeling of extreme discomfort—of straining and burning—between the poles, and some sensation of tingling, numbness, or "pins-and-needles," beyond their points of contact. If, under such circumstances, the current be made and broken, there is a painful feeling of shock at or about the joints which may be traversed. A similarly painful affection of the nerve-trunks may be observed when the conductors of faradization are widely separated. But the most painful of all modes of electrification is that by the Leyden phial, the sudden jar which is given by this mode of appliance being such as few can bring their minds to bear. A strong shock from a large Leyden phial, or from a battery of phials, will sometimes completely paralyze nerves of both sensation and motion in the parts through which it has passed.

The application of electricity to the nerves of special sense produces sensations of special kinds, such as flashes of light, a phosphoric odor, a saline and metallic taste, or a rumbling noise; and these sensations may be induced either directly or indirectly. Giddiness, faintness, or nausea may be also brought about by electricity; but the clinical uses of such applications have yet to be discovered.

In some cases of general torpor from cerebral disease or blood-poisoning, and in destructive diseases of the spinal cord, and in these alone, do we find the diminution of electric sensibility in the nerve-trunks, when that function is appealed to in the manner that I have described.

Therapeutical Uses of Electricity.—I told you in the first lecture that, by the aid of electricity you might, in some instances, cure a case—*e. g.*, one of hysterical aphonia; that in other cases you might relieve the patient—of pain, spasm, and paralysis; and that, in some other cases, although you could neither cure the disease nor actually diminish the symptoms, you might prevent their further progress—you might arrest the disease.

1. Remembering the objects that we have in view, let me recall to you for a moment what it is that electricity can do, in its several forms, in order that you may understand the better how to apply it to the various conditions of disease.

First, it may call into action, or it may increase the action, of a nerve or a muscle; and this is what you want it to do when nerve or muscle is in a state of inaction or under-action.

Secondly, electricity may reduce, or even annihilate for a time, the action of a nerve or muscle; and this it is that you may sometimes want to accomplish when a nerve or muscle is over-active. You can, therefore, use it, on the one hand, to reduce action or to stop action, when this is excessive, or, on the other, to bring out the action of a dormant muscle or a dormant nerve. If you have paralysis, loss of sensation, or loss of contractility in a muscle, you may, in many cases, so use electricity as to restore voluntary movement, to restore contractility, to restore sensation. If you have pain, over-action, or spasm—whether tonic or clonic—you may so use electricity as to diminish those conditions, and bring nerve and muscle to their normal states. The mode in which you use electricity will determine the effect that you produce.

(*a*) The under-action of a muscle or nerve shows itself in either paralysis—using that term in its widest and most general sense—or in anæsthesia; or, in diminished sensation—"hyperæsthesia," as it is sometimes called. It shows itself, also, in weakness of a limb; there need not be what we call "paralysis," but the limb on one side is weaker than on the other, although it is still under the influence of the will; by a strong effort the patient may do something with it—may, indeed, put all its muscles into play, but the movements are slowly produced, and are wanting in force. Still further, this condition

of under-action shows itself in a relative softness of muscle, and a flabbiness of limb; although, if you take a tape and carefully measure it, you will find it of the same size as its fellow. You can feel a great difference, which you cannot always represent by figures; but often there is, as the expression of central disease, actual, obvious, and measurable wasting of muscles and of the other tissues of the limbs.

(*b*) The over-action, or perverted action, of a nerve or muscle shows itself by spasm, as contrasted with paralysis; by hyperæsthesia, as contrasted with anæsthesia; or, by spontaneous pain, or something which is not spontaneous pain, or genuine hyperæsthesia, but which has been called "dysæsthesia"—viz., a painfulness of those sensations which are habitually unfelt when produced by ordinary impressions. For instance, when there is "intolerance of light," it is not that the patient can see better than you or I; he cannot see nearly so well; but he suffers pain during the ordinary act of vision. Do not confound this with genuine hyperæsthesia. The latter is rare, the former comparatively common; but both may be sometimes relieved by electricity.

There are, further, two conditions of the muscles which are the opposites of those I mentioned just now—viz., first, hardness of a limb, where it does not amount to actual rigidity; and second, actual rigidity, in which it is difficult to flex or extend the arm or leg. Further, there is a tremulousness of a muscle; and lastly, clonic spasm, showing itself in slight fibrillar twitching, or in catching movements of the limbs. These are all signs of an over-action that may sometimes be reduced by electricity.

As part of its effect upon muscular fibre, you must regard also the action of electricity upon the vessels. The effect on vessels is simply an extension into another region of that which I have already told you occurs in voluntary muscular tissue. There are certain contractile fibres in the walls of the vessels, and you can influence them by electricity in the same way as you can other muscular fibres. If the vessels are dilated, as they very often are in paralyzed limbs, you find that the skin has a dusky, bluish-red tint, and that the limb is cold. Look at the hands of a semi-paralyzed patient; you find the nails a bluish-red, the extremities cold, and the capillary vessels large. No part of the hand is actually white, all is dusky pink. Here electricity is useful; it contracts the dilated vessels, and induces a healthy state of the circulation in the limb, which no other means will produce so readily. You can do this, as I have seen again and again, without any electrification of the voluntary muscles. If you act on the muscles of the limb, and draw the hand first one way and then another, you gradually increase the circulation; but, without calling forth the action of any of these muscles, you can restore or much improve the circulation in the skin by a simple superficial electrification.

It is possible that electricity might have some effect upon another condition of blood-supply, just the opposite to the last—viz., that in which the vessel is contracted by the spasm of its contractile fibre. I do not know that here electricity has been of any practical service; but it is possible that, under some circumstances, it might be of use. At the commencement of an epileptic seizure, there is often a curious pallor of the face, and to a condition analogous to this in the pia mater it is probable that the loss of consciousness is due. It is possible that if one could catch a patient going off into a fit, one might stop or check the paroxysm. In those persons who are subject to sudden pallors coming over the face, it is possible that by a due administration of electricity something might be done. I know of no reliable clinical facts about the electric treatment of this state of spasm; but in the other condition, in which you get engorged vessels from loss of contractility of the fibre, electricity has been very useful.

2. And now, what are the modes of using electricity for therapeutical purposes? Over-activity of a muscle, or nerve, or vessel, may be reduced by the application of the continuous galvanic current, direct in its course through the limb, passing, that is to say,

downwards and not upwards. And remember, that this continuous current should not be so strong as to cause pain; it should be applied so as not to irritate the skin, and it should be applied in the course of the nerve, from above downwards.

Another form of electricity—faradization—may also be employed to reduce over-activity. If you find, for example, a man suffering from torticollis,—spasmodic wry-neck,—the sterno-cleido-mastoid and other muscles of one side acting most violently, and turning the head over to the opposite shoulder, you may stop that by passing through the sterno-cleido-mastoid muscle a galvanic current, or by applying weak faradization, rapidly interrupted. The interruptions have to be very rapid, for if they are not so the application only increases the muscular action. The interruption in a rotary magneto-electric machine is scarcely rapid enough, and is often very irregular; one of Stöhrer's batteries may be used. Remember, then, that the over-action of a muscle may be reduced by the application of faradization, as well as by the continuous current, but that the faradization must be weak and rapidly interrupted. Another way by which you may reduce the over-action of a muscle, is by faradizing the antagonist muscle. Supposing the flexors of the arm are contracted, as in some cases of "late rigidity," and you find it difficult to get the fingers open, the best mode of overcoming that condition is to apply faradization, not to the muscles affected, but to the other muscles, the extensors, so as to antagonize them. Again, in the case of torticollis, where a man's head goes jolting over to one side, you can reduce the over-action by putting the antagonistic muscles into action by faradization, and so pulling the head round into its proper position.

By the third form of electricity, also,—static or Franklinic electricity,—you may reduce over-action. For instance, in some forms of tonic spasm and painful affections of nerves, you may reduce the over-action by charging the patient from a friction machine. Thus, those over-sensitive conditions of nerves, which go by the name of neuralgia, may, many of them, be at once removed by a charge of static electricity, and in the same manner the electric charge may be employed for the reduction of clonic spasm, or of that tremulous condition which resembles or passes into the state of paralysis agitans.

When either a nerve or a muscle exhibits diminished activity, you may often recall its functions to their proper standard by the use of electricity, and for this purpose either of the three forms of application may be employed. Franklinic electricity is distinctly useful in some cases where faradization may have failed, but the interrupted galvanic current and faradization are those which are most commonly applied.

In passing from these generalities to details of electric treatment, I will first speak of cerebral and then of spinal lesions.

3. First, let me direct your attention to those cerebral diseases which cause paralysis, and, at the outset, request you to be cautious. If, under any circumstances, paralysis, induced by cerebral disease, occurs suddenly, you should not use electricity at all—at any rate as a therapeutic agent—until some little time has elapsed. If you want to examine the limb, now and then, for the purpose of diagnosis or prognosis, you may use it very cautiously with a low power—*e. g.*, a Cruikshank's battery, or some other form of galvanism. It is better to avoid faradization altogether, for you may set up mischief, or, if you do not set it up, some mischief may occur, and you may get the credit or discredit of having caused it. Remember that the discredit may be entirely due to you for having used electricity indiscriminately. When there is any sudden paralysis, from any cause,—whether hæmorrhage into the brain, or some embolic blocking up of a vessel, or some sudden congestion,—it is very unwise to disturb the patient in any way; the best thing for him is to be left alone, so pray do not use electricity.

But when the onset of paralysis, due to cerebral lesion, is not sudden, there is one condition under which I should advise you to be very cautious how you use electricity,

and that is when such paralysis is attended by pain in the head, weight of head, or giddiness of head. When these symptoms are present, it is well to postpone, at any rate for a time, electric treatment, and this although the symptoms have come on gradually. But supposing that the paralysis has come on slowly, and is unattended by any pain in the head, or by any of the other symptoms I have mentioned, you may use it, and that fearlessly; but, at the same time, you must be cautious in your mode of applying it, for, although you may be fearless about it, patients sometimes may not be so, and it is very desirable not to throw electricity into disrepute by so frightening a patient with your apparatus, or your mode of using it, that you get the consequences of fright set down to the bad effects of electricity. I have known this to occur in several instances. Young children, and even some who in other matters are not children, have sometimes been so frightened by the look of an electric machine that serious mischief has been done by the fright, mischief which the electricity used could not possibly have produced, and which has sometimes been set up when the machine has not been used at all.

I pass on now to the consideration of those cases in which you may be recommended to use electricity therapeutically, and here must redirect your attention to their varying conditions.

(*a*) First, let us consider that condition in which the contractility of the paralyzed limb, when you first apply the electricity, is good (testing the contractility, of course, according to the mode I spoke of in the last lecture). On applying the current, you find a fair amount of readiness in the response of the muscles. The patient feels the electricity, and you can see the muscles act. It need not move as strongly as the healthy limb, but it moves, and you can see that it does. There may or there may not be any rigidity of muscles under these circumstances, but, in either case, you do little or no good by electricity. You may diminish the rigidity, you may improve the condition of the muscle, it may become firmer, the limb may become a little warmer, the color may be more natural, that dusky blue tint that you so often find may be removed; but, so far as the paralysis is concerned, you may go on electrifying the patient day after day for a twelvemonth, and at the end of that time find him as much paralyzed as he was at the beginning. That is my experience, and it is so with regard to each form of electricity. It is true also whether the paralysis of the limb be complete or incomplete. In direct proportion to the amount of contractility present is the uselessness of electricity. If the contractility be perfect, although the paralysis to the will be absolute, you can do nothing. If the contractility be retained, and be only very slightly diminished, you will very slightly improve the condition of the limb, and very slightly improve its relationship to the will.

(*b*) When the contractility is much diminished, there is much good that you may do, and you will be able to do it by working upon this plan. Use electricity—in such a form as you will select, on the principle I shall mention in a moment—till you bring the contractility of the limb up to the normal standard, and, when you have done so, stop. You will usually find that the paralysis is diminished, and, in some cases, that it is cured. Let me remind you that it is the contractility, and not the power, of the muscle which is to be your guide, and assure you that to continue electric applications when the contractility is normal is to waste your own time, disappoint your patient's hopes, and bring electricity into disrepute.

There are two principal modes in which you may recall the lost contractility, viz.: the application of the battery current, and the application of faradization; either of these will be of service, and you may be guided in your choice between them by considerations of convenience. But supposing that you use the battery current, it must be interrupted. The continuous current for this purpose is of little or no avail.

Supposing that you want to apply galvanism to the arm or the leg in an ordinary case

of hemiplegia, where you find the irritability less than in health. The best way to apply the electricity is to take big sponges attached to handles; not little sponges, such as are applied with some machines, the size of the tip of the little finger, but good-sized sponges, as large as three fingers, a good inch in diameter. The handles should be of such a shape that you can take two of them in one hand, which, for certain purposes, is very convenient. Supposing it to be the arm that you wish to apply it to, take one sponge, well wetted, and put it on the shoulder, over part of the deltoid muscle, with the left hand, and take the other in your right, also well wetted, and stroke it down the arm over the lower part of the deltoid, then down the back over the triceps muscle, and then over the biceps in front, still keeping your left hand upon the deltoid. You need not spend much time over this; a few brushings down, occupying a few seconds, are enough for the arm muscles. For the forearm, bring the upper sponge down to the hollow in front of the elbow, and then give a separate stroke to the muscles here and there over the forearm. In the early days of a case of paralysis of the upper extremity depending on cerebral causes, I should not advise you to waste time, as you would be doing in devoting much attention to the small muscles of the hand. You may simply take a sponge and bring it down the fingers. In the lower limb you may in the same manner take one sponge and place it on the gluteal region, and with the other work down the limb. What you are doing is this: you are constantly making and breaking the battery-current through the limb by moving the sponge slowly downwards. If you were to leave it in one spot, it would be a constantly continuous current through the limb. By moving it you, at the same time, bring the current through every point of the muscles, so as to embrace each, from one end to the other, in an interrupted battery-current; and that is what you want to do to waken up its sensitiveness and contractility.

Respecting the use of electricity in this form, you will sometimes see statements made about the use of the inverse current in one case, the direct in another. I have never seen the slightest difference between the two, in their therapeutical effect upon paralysis, and I have compared them again and again. If the currents act continuously, the physiological effect on the nerve does differ in the two cases, the current downwards diminishing the irritability, the current upwards increasing it; but the therapeutical effects of the direct and inverse currents, applied as I have described, do not differ. In speaking of this, let me remind you of another fact which I alluded to in the first lecture, viz., that the current in passing down a limb acts more strongly than it does in passing up it. Supposing we had a Cruikshank's battery here of five cells, and that five cells was the minimum power that would induce contraction in a limb when the current was passing down the limb; you will find that the current from the five cells, if sent up the limb, will not produce contraction. So you must remember this fact in relation to the strength of the current.

So much, then, for the mode of application of the battery-current; a large sponge well wetted with salt and water; the upper sponge kept pretty steady, the other one moved slowly down the limb along the course of the muscles so as to embrace different portions of muscles in the current, and using a stronger or a milder current, according to the direction in which you send the electricity. But which ever form you use, please remember that you are to use such a force as is not painful; and you are to use such a force as will produce contraction. So just stop between the two extremes; do not use so weak a force that it is doing nothing, or so strong a force as shall be doing harm. The best guide for you, until you have had some experience of the individual upon whom you are going to apply it, is to try it on your own hand first; place it on your own hand, and use such a power as shall just, to your own consciousness, feebly move the muscle. You find sometimes that you are more sensitive than your patient, sometimes that he is

more sensitive than you; but do not use any strength that hurts you. Whatever hurts a muscle, so far as the sensation of the patient is concerned, positively hurts the patient. Electricity should never hurt people if you want to cure or relieve paralysis. Use such a power, then, as shall be distinctly, but not painfully, felt. I think that too great importance can scarcely be attached to this. I have known electricity so applied to a patient's limbs that he or she almost fainted, and the electricity has done no good. Of course not. The idea of applying electricity to a paralyzed limb so as to put the muscles into a state of cramp! That is the most mischievous thing you can do. Instead of waking up a natural action, you put it in the most hurtful form of action.

Further, do not prolong the application until the muscles or the patient is tired. If you wear the muscle out, you do it as much harm as when you pain it. A few seconds devoted to each muscle are quite enough, and you may repeat this every day, or you may repeat it every other day, according to the sensitiveness of the patient. It is very much better to repeat it even twice a day, where arrangements for so doing can be conveniently made, than to continue it for a number of minutes at a time, and so distress or weary the limb. If you find that the application of this or any form of electricity is followed by weariness in the limb, giddiness in the head, pain in the head, a feeling of faintness or of sickness, a nondescript sense of discomfort about the epigastrium, do not go on with the electricity at all; cease altogether for a time.

If you are about to use faradization, there are two or three points to be observed. You are not to tire the patient, not to pain the patient; therefore your application must be brief, and your current of moderate tension. You are to apply faradization with well-moistened sponges, or buttons covered with wet chamois leather; because, otherwise, you may irritate the skin, but produce no further action. You are to apply the current to the muscles; but there is a difference in the mode of application of the faradic and the galvanic current. With the galvanic current you may place, as I said, one sponge on the shoulder and the other on the palm of the hand. Do not do that with faradization, but keep the two poles near together. It is never worth while and never advisable to separate them widely. It is a good rule in ninety-nine cases out of a hundred, to hold both in one hand. There is a double reason for this; one is, that you cannot then get them very widely separated; the other is, that you have the remaining hand at liberty. If you separate the two poles of a faradic apparatus widely, you are in great danger of giving the patient pain without doing him good, and upsetting the circulation in his head. If you take a tolerably strong faradic current and apply it to the palms of both hands, you will find very uncomfortable sensations in several parts, especially in the joints, wrists and elbows; and if you look, you will see very little muscular action at all. On the other hand, if you put the two poles near together, you will find that you can put the muscles of the limb into tolerably strong action with a comparatively weak current, and without causing any pain.

In the treatment of paralysis it is important for you to bear this in mind: Take both poles in one hand, and act upon all the muscles *seriatim*. Begin with the deltoid, first acting on the anterior set of fibres, then on the middle, then on the posterior; go down to the biceps and triceps, and then faradize the upper part of the forearm. In the first few applications you need not go beyond the arm and forearm; and afterwards, when these are in a better state, it is desirable to pay special attention to the muscles of the hand. In these you want handles with rounded ends, narrow stems, and metallic buttons covered with chamois leather. Make them wet; take the two in one of your hands, and pick out the different muscles of the patient's hand separately, and especially the little interosseous muscles. By groping about you will gain a certain amount of skill, so as to be able to pitch quickly on the particular muscles that you want to influence.

You will find that, in both arm and leg, there are particular points at which, if you apply your current, you will put the muscles into much stronger action than if you apply it elsewhere. Generally speaking, these points are where the nerves entering the muscles are most superficial; knowledge of anatomy will help you find these points; but there is sufficient variation from these to make it necessary for you to examine the question electrically, and to discover for yourself, even in special cases, the points through which the current may be sent with the greatest efficacy.

Sometimes you will find curious actions which you cannot very readily explain. For example, in faradizing the perineal muscles and the tibialis anticus, by applying one pole just behind the head of the fibula, you may, by placing the other pole above the knee, on either side, raise the heel from off the ground or the bed, by calling the psoas and iliacus muscles into action. I have seen the foot raised from eight to ten inches from the floor in this manner by a patient who could not lift the heel higher than two, or at the most three, inches by the extreme of voluntary effort.

Now, what do you do when you apply electricity in this way? You may restore, if it be lost, the nutrition of the muscles; you bring back their bulk. If the limb be cool, as it very often is, from the defective circulation, you may bring back the normal temperature. When the contractility has been defective, you bring that back to its normal state, and you will find then that you have very much improved the relationship of that limb to the will of the individual; that is, you *pro tanto* improve, or it may be entirely cure, the paralysis. The mode in which electricity produces this effect, so far as we can understand it, is this: A limb has been out of use for a certain time; its muscles and nerves have lost their nutrition and their readiness to act; and the application of electricity has quickened the circulation and restored the diminished function of those tissues. We may, I think, go still further, and affirm that, in some instances, much more is accomplished than this merely peripheral effect. By stirring up the muscles and nerves of a limb, you may, to a certain extent, act upon the other ends of those nerves,—the ends that are in the back or head,—and so you may improve, by careful usage, the nutrition of the spinal cord, or of the brain. There can, I think, be no doubt of the reality of this secondary result. It is obvious that faradization of the extremity may seriously derange the circulation in the head; and it is no less clear that its application may be followed by results which a change in the conditions of the limb will not explain.

4. There is another point to which I will call your attention, and that is the condition of "rigidity" in a limb in cerebral paralysis. It is common enough in old cases, and sometimes is met with in those that are quite recent. In the latter cases I advise you not to use electricity, for you may do harm; in late rigidity you may employ it without fear, and with considerable advantage. Here you may either remove the rigidity altogether, and also improve the contractility of the limb, or you may only diminish the rigidity, or prevent its increase. It often happens that, in a case of three or four months' duration, you find the flexor muscles beginning to contract, so that the patient, waking up from sleep, in the night or in the morning, always finds his fingers bent, and the forearm prone, the flexure soon passing away again by a little rubbing or passive movement. After a time, although the hand may still be opened, it shows a constant tendency to close when it is left to itself, and at last the closure gradually becomes habitual. Now, the best way to counteract this tendency to closure is to faradize the antagonist muscles, the extensors of the fingers, and supinators of the forearm. Under such circumstances, you need not begin at the shoulder, because contraction of the kind I have been speaking of always begin at the distal end. You do not notice rigidity of the elbow till some time after you have noticed it at the wrist, nor do you observe rigidity of the wrist until after that of the fingers has been conspicuous. Sometimes in an early stage a few applications of electricity will cure

the rigidity, and not only remove the tendency to cramp, but even bring back the proper contractility of the limb. But in more severe and protracted cases, in which there is some persistent, and often progressive, lesion of the head, you cannot cure the rigidity—*i. e.*, you cannot remove it altogether; but even in these cases you may sometimes do good. You may prevent it from getting as bad as it would do if left alone, and this is a very important thing to do; for, after a longer time, the rigidity becomes extreme, and the patient often refuses to submit to any treatment. Then it is found that the nails have dug into the hand, and that the pent-up perspiration has become fetid and disgusting. It is impossible to prevent the occurrence of sores in some cases, except by a timely electrification of the extensors. You may often call into action the extensors of a much weakened hand by applying a moderate faradization with well-wetted sponges to the back of the forearm, or you may use galvanization for the same purpose, interrupting the current in the manner I have described, viz., by putting one sponge on the back of the forearm over the skin well-wetted, and making and breaking the current with the other hand by moving the sponge upwards and downwards an inch or two below the upper pole. But faradization is much better for this purpose than is the battery current, although the latter may be used to assist the former by applying it, in a continuous form, to the rigid and overacting muscles. For this purpose the current should be direct; one pole, well-wetted, should be placed in the hollow of the elbow, and the other in the hand. A moderate current should be allowed to pass continuously from the upper to the lower for ten, fifteen, or twenty minutes, once or twice daily, according to the severity of the case. You faradize the extensors and galvanize the flexors of the hand and fingers; and you may, if the rigidity has extended higher, adopt a similar plan with regard to the muscles of the forearm or the arm.

5. Shaking movements sometimes occur in cerebral diseases, and may take the form of mere tremulousness, or of clonic spasm. In these cases relief may be given by two forms of electricity. It may be given by static electricity, charging the patient generally with positive electricity, and leaving it there, having previously placed him on a glass-legged stool. Or you may pass a continuous current, of low force, through a tremulous limb. In this case the best way of applying it is to place the patient's feet in a pan of salt and water, to put the pole from the negative end of the battery into the water, and then let the patient's hand be placed in a basin of salt and water, connected with the other pole. The current will then come up the leg and down the arm; and you will find that in many cases of tremor or clonic spasm accompanying paralytic conditions dependent on cerebral disease, this continuous current affords marked relief.

6. It will be well to consider here the electrical treatment of chorea. Years ago it was said that good results were obtained, but I must say that, so far as my own experience goes, electricity has done no good in this disease. There are a vast number of cases of acute chorea that will get well if you leave them alone, and almost any form of treatment will appear to prove efficacious if it be taken in conjunction with change from a crowded dwelling-house to a well-ventilated hospital ward, to good food and quiet. I believe a great deal of the influence set down to electricity, ice-bags, iron, arsenic, quinine, and other medicine has been imaginary, and that the really curative agents have been those that I have mentioned. The modes employed have been the forms of electricity, and each one has lauded in the treatment of chorea that particular form to which he is addicted; but in my judgment the less one says, in the present state of knowledge, about chorea and its treatment by electricity, the better will it be for therapeutical science.

7. I pass now to the consideration of some brain affections that are accompanied by alterations in sensibility. And, first, defective sensation, or anæsthesia. Anæsthesia of a limb, or of two limbs, is very rare, except in association with motor paralysis, and then,

when it has occurred acutely, it usually exists only during the condition of shock. A patient, for instance, may become hemiplegic from an embolism, or from hæmorrhage, and you will find that during the first few minutes, or sometimes few hours, or, in rarer cases, days, after the onset of the attack, there may be some loss of sensibility. It varies in amount, but during the condition of shock may be occasionally well marked. But after that condition of shock has passed away, the sensibility commonly returns, and, so far as electricity is concerned, all I have to say is that, during that time, it would be very unwise to use any form of electricity at all.

In certain brain diseases of slow development you may find loss of sensibility, but these are, comparatively speaking, rare. You every now and then meet with some portion of skin defective in sensibility, from a tumor in the head or some other cause. But it is much more common for you to find some modified sensibility, such as "pins-and-needles," or painful impressions when the skin is touched. In those cases of acute cerebral disease, however, in which you do find persistent anæsthesia, or even only diminished sensibility, it is very rare for you to find that electricity does any good. It may do harm, and I should advise you not to use it unless the case were of such sort that you used it only for the purpose of diagnosis, and then only in such a form as you feel quite sure can do no mischief.

The examples of anæsthesia in which electricity is most useful are to be found in that curious class, or rather medley, of cases that goes sometimes by the name of "hysterical," for they are met with in women, and are found together with symptoms of the kind commonly regarded as hysterical. Here you meet with marked anæsthesia of the skin in different parts of the body, almost always associated with a certain amount of awkwardness of movement, and sometimes associated with some very definite loss of power. The two often go together, for both the apparent power of combining movements are distinctly related to the integrity of guiding sensations derived from impressions made upon the skin. I have known cases of this kind which had lasted for months or years, in which movements of the body or of certain limbs were weak and clumsy, and in which the patients, finding it awkward to use their limbs, had ceased to do so, and in whom, from disuse, the muscular power had become defective, but in which electricity has proved wonderfully useful, for sometimes, after only a few applications, the sensibility and motility has been restored completely. Electricity should here be employed in such a manner as to produce a definite and distinct impression on the skin. Supposing there is anæsthesia of the skin of the leg, place one pole of a faradic apparatus in the patient's hand, attach to the other a dry metallic brush, and pass it over the surface of the skin. In that way you send in a number of little bright sparks, which you may see very plainly in the dark, and you sting the skin very briskly. Or you may take a charcoal conductor, or a metallic conductor, and move it up and down on the surface of the skin. In the first few moments, perhaps, the patient does not feel it at all, but you now and then find the sensibility of the skin return with marvellous rapidity. Sometimes you will find it is a better plan to take two thoroughly wetted sponges and a tolerably strong current to make the muscles act briskly. By so doing, in the course of a few minutes the skin will often recover its sensibility. I am not able to explain thoroughly why this should be, but I have seen it again and again. An analogous condition is that in which the skin retains its sensibility while the muscles have lost their contractility, and in which by stinging the skin you will sometimes restore the muscular contractility.

Whatever may be their explanation, these are facts, and they have a certain relation to each other. In facial paralysis, for instance, by stimulating the skin, either by electricity or by a blister, you may often bring back the muscular action very speedily. Or, where there is a loss of sensibility of the skin, the muscles acting tolerably well, you may, by

putting them into forced action, restore the sensibility of the skin. I think that most likely what one does under these circumstances is to stimulate that which is common to both muscle and skin, viz., vessels; and, further, that, in thus acting on the skin, we exert some influence on the nerve-trunks, and also on their central extremities.

You may accomplish the same end by Franklinic electricity, by directing sparks from a prime conductor to the part affected, or by "charging" the patient, and taking sparks away from the surface by your knuckle or a brass ball. The effect of this application is, that in a little time you redden the skin and restore the sensibility. In extreme cases you may go still further and apply a moderate charge from a Leyden phial. For instance, you may inclose a limb between the knob and the discharging rod and let the shock go through it. This will sometimes bring back the sensibility when other means have failed.

8. There are two classes of spinal diseases to which I have already alluded, in one of which you have the true "spinal paralysis" of Dr. Marshall Hall; in the other of which you have "cerebral paralysis," although depending on spinal disease. In the one the muscle derives nothing from the cord, because the latter is diseased or destroyed; in the other the muscle is still associated with the cord, though that cord may be cut off from the brain.

(*a*) First, let us take the case of the true spinal paralysis. What can you do there electrically? The damage done to the cord is to be measured by the loss of electric irritability, and this whatever may be the form of electricity that you employ. If the electric irritability, in a case of this kind, be absolutely gone, and show no sign of reappearance after four or six applications, your prognosis is bad, and there is little or nothing to be gained by a persistence in the treatment.

Where you find a certain amount of contractility remaining, there is a great deal to be done. You compare the limbs of your patient with the healthy limbs of some one of the same age and sex, same class of constitution and thickness of skin, and if you find contractility diminished somewhat, but not lost, there is much room for hope, and a great deal will depend upon what you do as to the upshot of the case in the future.

Take, as an instance, the case of "infantile paralysis" (so-called "essential paralysis" of children), one of the best examples you can have. A child is a little feverish for twenty-four hours; you find it cannot sit up, cannot move its arms or legs for a few days. Then it begins to move one arm a little, and perhaps one leg; after a day or two more perhaps both arms. If you do not notice it again for a week, you may find one limb completely paralyzed and the other partially, the distribution varying. Post-mortem examination in such a case shows very often disease of the spinal cord itself, running along its whole length, a disease which, when left to itself, eventuates in the destruction of the tissue of the spinal cord, producing in the first instance perfect spinal paralysis, and in the last instance perfect spinal paralysis also, but the former curable, the latter perfectly incurable. In the early stage you find a certain amount of contractility left, but that is very defective. Here very much may be done by electricity. You find also this curious point, that the muscles respond much more readily to a slowly interrupted current than to a rapidly interrupted current. To faradization you will find them defective, and sometimes you cannot get them to act at all. If you interrupt the battery current very rapidly, they sometimes will not act to it, but if you interrupt it slowly, you find that they do. And what is very interesting about these cases, and to which I have already alluded, is this,—that the muscles sometimes appear to act much more readily than those in health to a very low current of galvanization.

To such cases the battery current, slowly interrupted, should be applied with a wet sponge, in the manner I described the other day. It should be applied every day for a few minutes, not troubling yourselves, at first, about particular groups of muscles, but

just applying it to the whole limb. If it is the leg, put one of your sponges on the sacrum, just below the groin, or in the gluteal region, and move the other sponge slowly down the front of the thigh, and then the back of the thigh and leg. You often find, under such circumstances, that after a day or two you have to use a stronger power to produce the effect that you produced at first; and you will find at the same time that the muscles respond more readily to faradization. It is well, then, to change and employ faradization instead, using it with sponges well wetted, trying to pick out particularly certain sets of muscles which have a trick, as it were, of lagging behind the others. These are, especially, the extensors of the foot, the perinei, and the extensors of the fingers. Here, then, you may apply faradization; and if the disease in the spinal cord be curable, I am sure you assist the process of the cure. If the disease has existed for some time before the case is brought to you,—and cases are often brought after three or four years' duration,—you will still find that occasionally you can do something. You may call into exercise the muscles of the limb; you can improve their nutrition and their strength; and you may do something towards effecting a change in the nutrition of the cord itself. Where, however, the disease has existed for some time, I have not seen that the repeated use of electricity has done much good, unless the improvement has been rapid at the commencement of treatment. You may see some enlargement of muscles, but there the improvement ends. When you find that, after four or six applications, there is no sign of electric contractility either by the induced or the battery current, it is useless to go on. I have managed every now and then to have cases treated for many months, with the forlorn hope that at some period or another there might be a ghost of contractility returning, but I must say it has been utterly unsuccessful.

(*b*) Let me now direct your attention to cases of paralysis, dependent upon spinal disease, in which there is not any true "spinal paralysis"; for the muscles still retain their connection with a healthy portion of the medulla, although, owing to disease at a higher level of that medulla, they are completely paralyzed to the will. In these cases electricity can accomplish but very little, and yet that very little may be of considerable service. Every now and then a certain group of muscles especially suffers; the sphincters of the bladder and rectum are very prone to be deranged. Sometimes the expulsive power is affected, sometimes the sphincter. It occasionally happens that, although you cannot in the smallest degree affect the limbs of the patient, you may give the patient a little more power over the sphincters. Probably the nutrition has failed, and the condition is something like that which I have already described. You may bring back power enough to make the sphincters competent; and to do that is to afford great relief. If you want to apply it to the sphincter of the bowel, the best plan is to put one sponge of the faradization machine over the sacrum, and the other, well wetted, to the anus; and if you want to apply it to the sphincter of the bladder, you place one sponge, well wetted, on the perineum, just behind the scrotum, and the other over the symphysis pubis. By such means you may prevent the frequent involuntary passage of evacuations. I do not say that you will do it in all cases, but you will in some.

But, again, you get cases in which the disease of the spinal cord is such as to produce only incomplete paralysis. The limb is weak, the contractility is less than natural, and the nutrition is disposed to fail. Can electricity do anything there? I think it may do a great deal; these constitute the class of cases in which it does very much good. But here you must observe the caution I gave you in the last lecture,—not to use too strong a current of electricity during the early days of an acute illness. If you suppose the patient to be suffering from the effects of a recent myelitis, meningitis, or hæmorrhage into the cord, it is a very foolish thing to galvanize him. If, on the other hand, disease is

creeping up slowly,—*e. g.*, white softening, or chronic myelitis, or if it depends upon syphilitic meningitis that may have occurred some time ago, and led to some slowly-induced pressure on the cord,—you may, in such cases of partial spinal paralysis, find electricity very useful.

Here it is that I would especially distinguish between the faradic and the battery-current. Where there is wasting of the limb, the application of the battery-current has appeared to me much more efficacious and much less mischievous than the other, when it is applied in the manner I have described. When, on the contrary, there has been no such wasting of limb, it seems to me that faradization has acted better,—faradization applied with wet sponges, and especially directed to the muscles. If the contractility of a muscle is good, and just in proportion as you find the contractility of a muscle good, your prognosis is bad, so far as electrical treatment is concerned. If you find, for instance, a limb perfectly paralyzed, but contracting perfectly well to galvanism, or sometimes acting even in excess, you can do nothing more by applying galvanism to that limb. Your prognosis may, however, be good if you find the contractility diminished, but not lost. If it be wholly lost, the prognosis is bad; if absolutely good, the prognosis is bad; if between the two, it is in proportion to the improvement you can effect in the nutritive condition by one or two applications of the current.

I have to mention only one other point in these cases of spinal paralysis,—cases of impotence. These cases are sometimes very much improved by the use of electricity applied in the same manner as for loss of power over the sphincter vesicæ.

9. Now a few words on paralysis from injury to or disease of the nerves,—the third group. These cases are distinctly of the same class as those which Dr. Marshall Hall called "spinal paralysis." Some persons have called them peripheral, local, or traumatic paralysis. So far as the contractility of the muscles is primarily concerned, it matters not whether you cut the nerves across or destroy the cord to which those nerves were attached. If you divide a nerve going to a muscle,—as, for example, when the facial nerve is divided by disease in the bone,—you have "spinal paralysis" of the facial nerve in the sense in which Dr. Marshall Hall used that word. The severance of muscles from the spinal centre may be complete or incomplete, and you can measure the amount of damage done by the amount of electric contractility that remains. If a muscle or a group of muscles has been for a time completely paralyzed by a damage done to a nerve or by neuritis, and yet the morbid state of the nerve was of such kind that it might be repaired, then, although the nerve has recovered, the results of its disuse may remain, and imperfect paralysis may persist. For instance, take this example, which occurred to myself not very long ago. A man tried to lift a heavy portmanteau, strained himself in doing so, had great pain in his arm afterwards, and then most intense, indeed agonizing, burning and tingling in the tips of his fingers and palm of the hand. After a time the pain disappeared, and then it was found that his hand was excessively weak and that the muscles were wasted. He had strained his forearm, injured its nerves, and set up some neuritis; but after the neuritis passed away, there remained paralysis of the muscles, with wasting, and almost complete loss of electrical irritability. It was not until some time after all these symptoms had occurred that he was treated electrically, and then the difficulty to be contended with was the wasted muscles. In looking at what he could do with his hand, we found that there was every movement of the hand that could be performed; he could bend all his fingers, separate them, and bring them together again; but he could not do this quickly, nor could he do it forcibly. There was partial paralysis of all the muscles of the hand, depending upon damage to the nerve, and also upon consecutive changes in the muscles. Electricity was applied to the forearm and hand, and the muscles soon improved in their nutrition; and with that improvement in

the nutrition of the muscles the voluntary power returned. You may find a similar thing, now and then, in the case of facial palsy,—paralysis persisting as the result of disease. Examined electrically, you find that there is a certain amount of contractility left, although it is defective. If you apply electricity after an interval of two or three weeks, you may often cure the case by a very few applications; but if the paralysis has lasted for six months, you will find at first very little contractility indeed, and you will have to apply electricity again and again before you obtain any distinct marks of improvement. Sometimes there is slight restoration of voluntary power after even the first or second application, and then the subsequent improvement is very trifling When the paralysis is imperfect, and the contractility is only diminished, you may accomplish much; but when the contractility has quite disappeared there is little or nothing that you can do. You never can tell, until you have made several applications of the current, whether or not the case is curable, for, although a group of muscles may be completely paralyzed to the will, there may be some few nerve tubules that have escaped destruction, and their functions may be slowly recalled.

The mode in which you should apply electricity in cases of local paralysis is the following: Place one conductor, well wetted, over the trunk of the nerve, and the other over the muscles, *seriatim*. If you are using faradization you may keep the second conductor steady; if galvanism, you must move it about, in order to interrupt the current.

Paralysis of the third nerve, with ptosis or strabismus, may be treated by galvanism or faradism; in either case one pole should be placed behind the ear, in the hand, or on the cheekbone, and the other should be applied to the lid. A weak current only should be used, and the application should be brief.

In paralysis of the seventh nerve, from simple exposure to cold, the best plan of using electricity is the electric brush. Place a well-wetted sponge behind the ear, and take the metallic brush and brush it over the skin so as to sting the face. If it have existed longer, and there be much wasting of muscle, the same rule applies; but here you should also operate upon the muscles, and I would advise you to use the battery-current for a certain number of times, until you find that its power of eliciting contraction diminishes, and then to apply faradization.

10. And now a word or two about other kinds of paralysis, depending more or less on some morbid condition of blood, or nerve, or muscle, or of all these elements together. And, first, let me direct your attention to poisoning by lead.

(*a*) I do not know the precise mode in which lead produces paralysis, or why it singles out particular muscles; but, in those muscles which are affected, it is found that there is undue readiness of response to a slowly interrupted galvanic current, and greatly diminished contractility to faradization, and to a rapidly interrupted galvanism. Whatever may be the explanation of these points, remember that it is not simply a question of difference in the kind of electricity applied, for, if you rapidly interrupt the battery-current, you find the muscles in lead-palsy do not act to that. The rapidity of the interruption may account for the inaction of faradization; but, why the muscles that are paralyzed should act more readily than healthy muscles to a slowly interrupted current, has not yet been explained. The mode of treating lead-palsy has been by faradization, or, by the application of the battery-current. You take a current from, say five cells, apply it to the extensors of the hand, and you produce definite contraction. After a few applications you often find that five cells are not enough; you have to use seven, or eight, or ten; and in a few weeks of application you have to use quite as many to produce contraction as in a healthy limb. At first they are very sensitive to the battery-current; then gradually, as you apply it, they grow less so, and you then, curiously enough, find them brought back

into their normal relationship to faradization. There is no doubt about the fact that the improvement in nutrition, which seems to be brought about by the battery-current rather than by any other means, entails a loss of the morbid irritability to that battery-current, and with that improvement in nutrition you get a return of the normal contractility. If you have not a battery-current, you may use faradization to begin with; but if you do, be quite sure that you affect the muscles. I have known patients with lead-palsy treated by having their hands in water and their feet in water while the current is passed from one to the other. Such a proceeding is not of the slightest good. If you were to apply one pole of a faradization machine to the chimney-pot of a man's house, and the other to his door-step, you would be as likely to get the current into the muscles that you want to benefit. You must apply faradization locally, with thoroughly well-wetted sponges, and of such low intensity that it is scarcely felt, and yet of sufficient strength for you to be certain the muscles respond. Use it every day, and have particular muscles singled out—just those which are the most paralyzed. In these cases it is often difficult to get the current into the limb, and you will find an advantage sometimes in soaking the limb by covering it, for an hour or two beforehand, with wet lint and oiled silk at the spots where you want to apply the sponges. Get the skin well moistened, and the current will pass through more readily.

(*b*) One word about the paralyses that come from anæmia, and are often met with in pale hysterical girls. Some are set down as hysterical without, I think, any just cause; they are more or less dependent, probably, on an altered blood state, which may affect the cerebral centres and lead to these peculiar weaknesses. I am quite sure that some of these local paralyses are relieved occasionally by static electricity administered in the mode I have described already, by sparks from the skin, or prime conductor, or by a Leyden phial. One of the forms which anæmic paralysis occasionally takes is that of loss of speech, or change of voice, dysphonia, or aphonia. It is often called hysterical aphonia. It may be hysterical, according to the use of the term by some people, but in many cases it exists quite alone and apart from anything that one ordinarily recognizes as the hysterical temperament. When present there is almost invariably marked anæmia. Here, sometimes, a few sparks from the prime conductor of a machine will bring the voice back directly. Sometimes, if that will not do, the Leyden phial will immediately succeed, and this after you have applied electricity in other forms without success. A few sparks do not cause pain; but if you apply faradization to the larynx, you do cause a great deal of pain. It is uncomfortable to have even a weak faradic current passed through the larynx, and it is often perfectly unsuccessful; and yet a spark, which causes no distress, will often bring back the voice at once. In certain cases it is desirable to introduce the current of faradizatien right into the glottis, and this is so when there is distinct paralysis of the vocal cords. You may see with the laryngoscope that one or the other cord or that both cords are paralyzed; and it is quite easy to apply faradization to the larynx internally in the manner recommended by Dr. Morell Mackenzie. One pole is held in the hand, or applied to the nape of the neck; the larynx is well exposed; and the other pole is carried between the cords by an instrument constructed for this purpose. This is shaped like a catheter, with a small sponge at the end; and this sponge has a wire passing from it inside the catheter up into the handle, which is so connected with a key that you can either make or break the current by pressing on the key. Having placed the sponge in between the vocal cords, you touch the key and send the current through them. Patients will sometimes cry out the moment that the application is made, and you may very easily imagine that they would if they have any crying power left in them. But many patients prefer the internal faradization of the larynx to the external, affirming that it is the less painful of the two.

11. There are a few words only which I wish to say about local spasms. The forms of spasm in which electricity has been most commonly used are "torticollis," a spasmodic condition of the muscles of the neck on one side; "writer's cramp;" and so-called "histrionic spasm" of the face. It is said that such cases have been cured, but my own experience has been unfortunate with regard to them. I have tried electricity again and again, and in every available form, but have never seen it do any good. I have tried battery-currents, direct and indirect; I have tried faradization weak and faradization strong, with wet sponges and with dry; I have used static electricity also, and each form of electricity persistently; I have not given up because the treatment has done no good at first, but I do not know one single instance in which it ever seemed to me to do the smallest good. In torticollis, for the time being, you can put the head straight by either a strong battery-current passed through the contracting muscles or by faradization of the other side, the muscles of which are often weak, but directly you cease the application the head goes back again to its abnormal position. I have obtained similar negative results in cases of both writer's cramp and histrionic spasm. Others have been more successful, and I trust that your experience may resemble theirs rather than my own.

12. In painful affections, such as the neuralgiæ, migraine, sciatica, tic doloreaux, and the like, and also in some conditions of modified sensibility, such as the spontaneous feeling of heat or cold, the sense of numbness, of tingling, "pins and needles," or such like discomforts, electricity is often of considerable service. It is the continuous galvanic current which you should use, and it should be of only such strength as to be just perceptible by the patient; it should be applied to the part with well-wetted sponges, and should be applied for a short time only, but with frequent repetition. I know of nothing more distinct or more satisfactory in therapeutics than the relief which may often thus be given to suffering of the most intense character, the relief being very rapidly induced and in many cases permanent. In applying galvanism to the head you must be very careful to avoid using such a strength as to cause vertigo or faintness, and I am sure that you may avoid these evils by trying the current upon your own head first, and then by carefully observing the patient and stopping the application for a time the moment that there is any complaint, by word, gesture, or look, of any uneasiness in the head or epigastrium.

Electricity is one of the most powerful agents that you can employ in the treatment of disease; but it is useful, useless, or mischievous, according to the manner in which it is applied, and my endeavor has been to furnish you, by means of these lectures, with the information which shall enable you to derive help from it in diagnosis and confer real advantage upon your patients by rightly directing its therapeutic powers.

Respecting the comparative value of the galvanic and faradic currents, Dr. A. D. Rockwell, of New York, says:

Since the time of Remak the comparative value of the galvanic and faradic currents in therapeutics has excited considerable interest, and at one time was the subject of angry controversy. At the present day all electro-therapeutists who keep abreast of the progress of their department agree that both currents are of service, that one will fulfil certain conditions for which the other is inadequate, and that no one who expects to secure in practice the complete effects of electrization can dispense with either. Concerning the special indications for the use of the one or the other, opinions widely and honestly differ according to the opportunities and experience of each individual. In Germany, where

the school of Remak is dominant, the galvanic is used more than the faradic; in France, at least among the disciples of Duchenne, the faradic more than the galvanic. In England and America both currents are employed, general practitioners using chiefly the faradic, while specialists use both with more or less exclusiveness.

Much of the confusion that exists concerning the differential indications for the use of the galvanic or faradic currents arises from an imperfect, or erroneous, or exaggerated conception of the distinctions in their physiological effects.

The general belief or supposition is that there is between them a radical and important difference in *kind*, and that an appreciation of this distinction is essential for a knowledge of the differential indications for their use. From the accumulating results of experiment and experience in electro-physiology, diagnosis, and therapeutics, we think that there is strong reason for regarding the essential distinction in the effects of these currents on the body as mainly of *degree*, and that this is the scientific basis for their differential employment.

Thus the galvanic current, applied on the face and head, produces flashes before the retina, while, as a rule, the faradic will not. We have, however, frequently treated certain sensitive pathological conditions where the same flashes were caused by the faradic. With the improvement in the general condition of such patients, this unusual susceptibility to the faradic influence always disappears. An important peculiarity of the galvanic current is that, when applied on the neck, it causes a metallic taste, and yet we have, on several occasions, treated cases of constitutional neuralgia combined with excessive irritability, where the same effect was markedly and even unpleasantly produced by the faradic current when applied above the seventh cervical vertebra. Other well-recognized peculiarities in the effects of the galvanic current, distinguishing it from those of the faradic are *giddiness* and *vertigo* when applied on or near the head, *diplegic contractions* and special sensations down the upper extremities and over the body when applied to the cervical sympathetic; marked chemical effects, especially when used in large quantity, redness and burning sensations of the skin at the points on the surface where the electrodes are applied. All of these effects are observed in a less degree from the faradic current, and some of them in cases of great abnormal sensitiveness are very decided. When we come to study their therapeutic effects we also find that both currents differ chiefly in degree. In the form of localized electrization both can produce muscular contractions in paralyzed muscles and relieve local neuralgia; both cause absorption of abnormal secretions and both can directly affect the brain, spinal cord, sympathetic, and all the internal organs, producing in different degrees, the various therapeutic results that directly and indirectly flow from electrical excitation of these parts. In the form of general electrization both currents, besides producing most of the results of localized electrization, act as powerfully stimulating tonics, and thus form most efficient aids in the relief and cure of nervous exhaustion, nervous dyspepsia, constitutional neuralgia, and of a wide range of nervous diseases associated with or dependent on general debility.

In electro-surgery both currents avail to discuss tumors, heal ulcers, and hasten absorption, although the galvanic current, when used in large quantity, produces cauterizing effects to which the faradic is unequal. And yet the difference in *degree* between the effects of the two currents is so marked and so clearly demonstrable as to be practically equivalent in certain instances to a difference in *kind*, and to give very important and remarkable advantages to one current or the other, according to the indications offered.

Advantages of the Galvanic over the Faradic Current.—The advantages of the galvanic over the faradic current are:

1st. *A greater power of overcoming resistance.*

It therefore affects the brain, spinal cord and sympathetic more powerfully than the faradic, since the anatomical position of these parts is such that considerable resistance must be overcome in order to directly affect them.

For the same reason, it is usually to be preferred when it is desired to affect the middle and internal ear, the retina and the muscles of the eye.

2d. *A power of producing muscular contractions in cases where the faradic fails.*

This peculiarity of the galvanic current has been observed so frequently, and in such striking instances, that it has become an accepted fact of electro-therapeutical science.

After a certain amount of treatment by the galvanic current, the paralyzed muscles frequently resume their susceptibility to the faradic.

3d. *A different and far more potent chemical action.*

The chemical power of the galvanic current is most markedly seen when used for the purpose of galvano-cautery, or "galvano-caustic chemique."

In order to produce the energetic caustic effects of the galvanic current, it is necessary to use elements that generate quantity of electricity, and to combine them in such a way that the quantity produced shall be very large, since an ordinary single element, or indeed, a large number of elements arranged for intensity, exhibit only a comparatively feeble cauterizing effect. It is because the galvanic current can be thus arranged for quantity, more than in any difference in kind between the effects of the two currents, that it has so marked and peculiar a superiority to the faradic as to practically amount to a difference in kind. The quantity of the faradic can be but slightly increased, and hence, although it does possess some chemical virtues and produces slight chemical effects, it is not indicated where such effects must be very energetic or concentrated. The superior efficacy of the galvanic current to the faradic, so often observed in the treatment of neuralgia, of atrophied muscles, rheumatism, etc., is probably due to its greater chemical or catalytic action. It probably induces more rapid and more important molecular and other changes in the tissues.

Advantages of the Faradic over the Galvanic Current.—The advantages of the faradic over the galvanic current are these:

1st. *By virtue of its frequent interruptions it more easily produces muscular contractions when passed over the muscles or the nerves that supply them.*

In order to produce muscular contractions with the galvanic current, it is necessary to interrupt the current, and unless it is quite powerful, to localize at least one of the electrodes over the motor nerve by which the muscle is supplied. On the contrary, the faradic current is in a condition of rapid interruptions, and produces contractions when indifferently passed over the surface of the muscle, as well as when localized on the main motor nerve that supplies it. This advantage of the faradic current is best appreciated in *general electrization*, the powerful tonic effects of which are partly and quite largely due to the passive exercise, and consequently important changes of tissue that result from the several thousand muscular contractions that take place during an ordinary sitting. In localized electrization this advantage is not so clearly or strongly marked, since in this method, by a proper knowledge of electro-therapeutical anatomy and sufficient care, it is possible to direct one of the electrodes on the motor points; and yet even here the faradic current is much more convenient, because its employment requires no arrangement for interruptions and less minuteness of attention to the situation of the "motor points." The exceptional cases of paralysis, where the muscles have lost their susceptibility to the faradic current, do not interfere with the general rule.

2d. *It is less likely to produce unpleasant or harmful effects than the galvanic.*

In certain acute and chronic pathological conditions, where it is desirable to produce

a decidedly stimulating effect without marked catalytic action, the faradic current can alone be used with benefit and safety. To confirm this statement, we rest mainly on the evident results of clinical observation. We recall at least two cases of severe neuralgia of the trigeminus, where a mild and rapidly interrupted faradic current, applied on several occasions, relieved the pain very decidedly.

In order to hasten recovery, the constant current from but four of Bunsen's cells was for a moment directed along the course of the painful nerve. In both instances the neuralgia immediately returned with increased severity, but was relieved a second time, and soon recovered under the influence of the current first named. We may, indeed, refer to a number of cases of severe constitutional neuralgia and excessive nervous exhaustion where the faradic current invariably relieved, and where the galvanic as invariably aggravated the symptoms.

Our own experience teaches, that wherever the constant current can be used without injury, there also will a faradic current of relative intensity be harmless. It teaches further, as above stated, that in certain conditions, where the faradic current is not only harmless, but of decided benefit, the galvanic, even when its tension is very slight, may occasion evil results.

Galvanization of the Sympathetic.—One of the most important advantages possessed by the galvanic over the faradic current is the readiness with which the former affects the sympathetic.

The attention of the profession was first called to this fact by Remak, who observed the occurrence of diplegic contractions when the superior cervical sympathetic was submitted to the influence of the constant current.

This observation of Remak was confirmed by Fieber, who produced similar phenomena in the living animal by exposing the sympathetic and directly galvanizing it.

It does not come within the scope of this short paper to theorize at length concerning the beneficial results following galvanization of the sympathetic.

In those cases of paralysis of vasomotor nerves and arterial spasm that are benefited by this method of treatment, the favorable results may be ascribed in brief to the influence exerted on the vasomotor nerves.

The few following cases may serve to illustrate some points in the above remarks:

Case of Persistent and Excessive Nausea.—Recovery follows Galvanization of the Sympathetic.—Mr. H. S., a tall spare man, aged 49, was the victim of a mild form of nervous dyspepsia, from which he had suffered slightly for many years. Some three years since, a very annoying symptom supervened. Every morning soon after breakfast he observed a feeling of nausea, that lasted a short time and then passed away.

This symptom gradually increased in severity and duration, until it became most distressing, and for more than two years no form of medication had afforded more than temporary relief. We first made use of the faradic current by the method of general electrization, directing the applications more especially to the back of the neck, so as to affect, as far as possible, the sympathetic. As no relief followed, we resorted to the galvanic current, applying the positive pole at the inner border of the sterno-cleido-mastoideus muscle, and the negative at the sixth cervical vertebra, and allowed a mild uninterrupted current to pass for three minutes. By this method the sympathetic was decidedly influenced, and relief was afforded. Succeeding applications gradually reduced the intensity of the nausea until the tenth séance, when it disappeared completely and has not since returned.

Case of Disordered Nervous Action relieved by Galvanization of the Sympathetic.—Mr. H., aged 40, complained of an unpleasant feeling of constriction in the throat, and a constant pricking or tingling in the arms and hands. The patient, who was of a highly

nervous organization, stated that these symptoms had existed for a number of years. During the last few months, however, they had become so decidedly aggravated as to excite alarm, and impelled him to seek professional advice.

A number of general applications with the faradic current were administered without special result. We then resolved to influence the sympathetic by the galvanic current.

The first application to either cervical sympathetic excited a decided perspiration in both axillæ and along the inner side of the arms. The symptoms of which he complained became rapidly less marked, and after twelve applications ceased to annoy him.

Patients suffering from cerebral effusions frequently speak of an unpleasant roughness in the eye. This symptom may probably be ascribed to dilatation of the smaller blood-vessels through weakness of the vasomotor nerves. We have found that this condition is almost invariably relieved by galvanization of the cervical sympathetic.

An Aggravated Case of Chorea resists the Action of the Galvanic, but yields to General Electrization with the Faradic Current.—The little patient in whose case the results of treatment by the faradic currrent were so gratifying, was under the professional care of Dr. J. O. Farrington.

Dr. George T. Elliot was called in consultation, and by these gentlemen electricity was advised.

Some two months previous to the consultation certain abnormal movements, such as starting suddenly to his feet, throwing out a hand or a foot, etc., were observed by the teacher of the boy. Two weeks subsequently the patient was seized with well-marked choreic symptoms of the right side of the body, and in two days the disturbance extended to the opposite side. So constant and violent were the movements of his arms and legs that it was impossible to keep him on a bed or sofa. It was necessary to place him on the carpet, surrounded by inflated rubber bags. Intelligence seemed to be perfect, but the power of speech was lost, and the sufferer made known his wants by impatient cries and ill-directed motions.

Sleep was impossible without the nightly administration of an opiate. Contrary to our judgment, but by suggestion, we commenced treatment by the use of a mild galvanic current directed especially to the base of the brain and the spinal tract; but this method served only to aggravate the child's condition. We then resorted to the faradic current by the method of general electrization, but so violent were the involuntary movements in the limbs and body of the patient that it was with difficulty that he could be held in a sitting posture and his feet kept on the copper-plate to which the negative pole was attached. The applications were *general*,—every portion of the body, from the head to the feet, being influenced on each occasion.

Improvement was manifest from the very first. He was at once enabled to sleep soundly, although his opiate was reduced one-third, and after the fourth application it was dispensed with altogether. In the course of three weeks, during which time fifteen applications were given, the case was so far improved that the patient was able to utter distinctly words and sentences. The choreic symptoms were so much diminished that the boy could readily sit quiet and alone, and during an application was able to command the movements of his body and feet. Improvement continued during the administration of a few more applications, when the child was taken to the seashore, where in two weeks he quite recovered. Some three months since, after having enjoyed excellent health for a year and a half, the boy suffered from a second attack. He was immediately subjected to the influence of electrization, and recovered even more rapidly than before.

Respecting the therapeutical uses of galvanism, Dr. Samuel Wilks, F.R.S., Physician to Guy's Hospital, says:

It must be generally admitted that the therapeutical uses of galvanism have received a fresh impulse since the introduction of the continuous current into practice. Until a few years ago the only method in use, except frictional electricity, was that of faradization. This was sometimes beneficial, but as often quite valueless, so that galvanism was either indiscriminately recommended in all forms of paralysis or was systematically neglected. A very different feeling, however, prevails at the present time, for we are beginning to discern in what cases faradization is useful, and in what cases it fails; more particularly has it been noticed that it is in those very cases where faradization has been useless that the continuous battery current has been so fruitful of results. We, some years ago, introduced into our electrifying room a large battery in which any number of cells up to 100 could be combined, and with this instrument we have witnessed a success in many cases which scarcely could have been anticipated. We have a large number of patients daily being operated upon, and two or three attendants constantly employed either in the room or in the wards. It has not yet been satisfactorily determined why one form of galvanism should fail to stimulate a muscle and be useless as a remedy, whilst another form excites it to contraction and is curative. This may be dependent upon the condition of the muscle or of the nerve which supplies it, or the centre whence the nerve springs; at the present time the facts themselves are not sufficiently established, but when they are so we shall be able to use them as a means of diagnosis. All I shall attempt to do here will be to state some of the facts we have observed, and thus offer a small contribution towards the material out of which some more important conclusions may be eventually framed.

In the first place, we had no sooner possessed our battery than we discovered its marked value in cases of simple paralysis of the limb. In these cases faradization often fails to produce the slightest effect, whereas the application of the continuous current immediately excites the muscles to contraction, and eventually brings about a cure. A good case of the kind I give below. Then, again, in various forms of paraplegia its good effects have been most striking. As I have before said, it is most difficult to ascertain, in various forms of paralysis, whether an organic disease of the cord exists or not, seeing that all the symptoms which attend it may occur in the case which is functional and curable, and therefore it is true that galvanism has been used in many cases and failed; but, on the other hand, we have had a variety of cases which may be included under the term paraplegia, where a complete cure has been effected by applying the current to the back. In some cases of locomotor ataxy I have witnessed perfect recovery, both in hospital and private practice; also in cases of commencing progressive muscular atrophy. In paralysis agitans I never saw much good done by faradization or any other remedy, but in a case I mention below it appeared as if much benefit might accrue from the use of a continuous galvanic current down the spine. In no case is the effect of the continuous current to the limb so remarkable as in the atrophic paralysis from lead, two examples of which I shall presently relate. The fact has now for some time been observed that the muscles in this affection are not susceptible to the interrupted current or faradization, that a painful amount of it may be used and yet there shall be no response on the part of the muscle. I have had several cases in the hospital which completely establish the fact. On the other hand, if the continuous battery current is used, even in a mild degree, excitation immediately occurs; that is, when the current is completed and again broken.

In the very first case on which I experimented, some years ago, we found in the case of a young man suffering from lead paralysis that, whereas no irritation of muscle could be displayed by the magneto-electric machine, immediate contraction took place on the

application of fifteen cells of the battery, an amount which produced a scarcely perceptible effect on the arm of a healthy student.

It is observed that as the cure progresses so the susceptibility to the continuous current becomes less, and that to faradization greater, until, as in the healthy subject, both forms cause contraction of the muscles. The case of lead is very striking, because there are kinds of paralysis in which the two forms of galvanism act in the opposite manner; thus, lying in a bed near that of our patient, who was the victim of lead poisoning, was a girl suffering from old-standing spinal paraplegia; in her case the continuous current produced not the slightest effect in stimulating the muscles of the leg, whilst faradization produced strong and painful contractions of the muscles. The same occurred in a man who had long been bedridden with an incurable paraplegia. It has been thought that faradization acts directly upon the muscle to stimulate it, whilst the continuous current acts through the nerve. This has by no means been proved, but if it had, it might be used as an argument that in lead poisoning it is the muscular rather than the nervous system which is affected by the metal. Such an opinion, however, is not borne out by experience, seeing that the whole cerebro-spinal centres may become atrophied in plumbism, as evidenced by epilepsy, general paralysis, or dementia. The atrophy resulting from lead differs from that which is called idiopathic in this respect, that although in the two cases no difference is observable in the form of wasting, yet in the latter there is very little susceptibility to either form of galvanism. It has been suggested by Dr. Russell Reynolds that there is no essential difference between the primary and the induced current, but that the simple interruption in the one case is sufficient to account for its peculiar effect; that muscles under abnormal conditions may not be able to take cognizance of a simple current passing through them, whereas they would if it were broken. If this were so, the primary battery current, if interrupted, should produce the same effect as the ordinary induced current or faradization. In one or two cases where the experiment was tried, the result did not verify the suggestion. Where, for instance, one pole was placed just below the elbow, and the other pole stroked down the arm, a contraction took place when it was lifted from the limb or again replaced. The current was then interrupted by a wheel, but exactly the same phenomena occurred, contraction on making and breaking contact, but none whatever as the sponge was stroked down the arm. With faradization, on the contrary, violent contraction took place. In this case, therefore, the difference between the two forms, even when both were made to intermit, seemed well marked. Further observations, however, are required before I could give a decision on this matter, either for or against the suggestion of Dr. R. Reynolds.

I have already spoken of the intractability of cases of spasm and contraction of the muscles. In many cases organic disease of the spinal cord and nerves exists, and, therefore, no result could be expected; but even in others, as in wryneck, where an immediate effect of galvanism was witnessed, no permanent good resulted from its use. Even in cases of so-called hysterical contraction of the arm I have been much disappointed at the failure of galvanism.

The effects on the muscles in the cases of spasmodic contraction is seen in the reports, in which it appears that they are more susceptible to faradization than to the continuous current.

One must not forget to mention the soothing effect of galvanism. In cases where neuralgic pains have existed, patients have expressed themselves as much relieved by its application, and have often slept better afterwards.

The public is so much impressed with the value of electric baths that I proposed to try it in a case of lead poisoning. I am aware that others have pronounced it to be valueless, which in all probability is the case, there being no proof that the galvanic

current passes anywhere but over the surface of the body. In my case the speedy success was so remarkable as to throw strong suspicion on its having had any value at all.

I give the case below with the mode of use. Usually, I believe, the plan has been to place the patient on an isolated stool in the water, with one pole in his hand, the other being attached to the bath. In the present case Mr. Sandy used a different method.

Case 1. *Paralysis of Leg.*—George W., æt. 36, admitted into Stephen Ward June 19th, for weakness of the left leg, and left July 23d. This man was the subject of a remarkable enlargement of the veins on the surface of the abdomen, indicating some obstruction to the vena cava. He had observed this fourteen years, but it had given him no inconvenience nor interfered with his employment.

Patient stated that in March last he was seized with very acute pains through the left hip and groin, which gradually spread down the leg, and these pains were worse at night. Went to Swansea Hospital, where knee became contracted, and he took to crutches. He was then sent up to Guy's Hospital. He was put to bed, being quite unable to walk, on account of pains and weakness in the left leg. On examination, no local cause was discoverable for the symptoms; the leg was somewhat drawn up, it was perceptibly wasted, being smaller than the other, and sensation slightly impaired. On testing the limb, the muscles were found to respond to both the faradic and galvanic currents. He was then ordered the continuous current, to be applied daily to front and back of thigh. After the first application, he expressed himself as having much relief from the pain, and in a few days it had altogether left him. At the same time the strength returned in the muscles, so that in a few days more he could walk. The current was still applied, with a daily improvement in the strength of his leg, so that on July 10th he was walking about, and on the 21st he sufficiently recovered to be able to leave the hospital convalescent and nearly well. Patient took no medicine.

Case 2. *Paralysis Agitans.*—J. B., æt. 40, had been suffering for three years from paralysis agitans. The complaint commenced in the right hand, afterwards proceeded to the left, and then to the legs, until a general tremor of the whole body took place, including the face, and affecting the speech. He had been under different kinds of treatment, but without any benefit. I wished to try the continuous galvanic current to the spine, and accordingly fifty cells (Cruikshank's) were used for ten days. After the second application the patient, who had previously had very restless nights, obtained refreshing sleep. After four or five applications he began to experience a decided benefit, saying he always felt lighter and steadier directly he had been operated upon. The duration of this improvement lengthened day by day. The patient then left for the country and has not since been heard of.

Case 3. *Lead Paralysis.*—Mr. S., a gentleman of middle age, was brought to me on March 11th, 1872, by Dr. Charlton, of Fareham, suffering from a most severe form of lead paralysis. His whole frame was attenuated in consequence of the atrophy which his muscular system had undergone; his limbs were very much wasted, and he was proportionately enfeebled. He tottered when he walked; his hands shook, and were so weak that he with difficulty could raise them to his head or button his coat. He resembled, indeed, the condition of a man with progressive muscular atrophy, only in this case it was induced by lead and was not idiopathic.

The history which he gave of his case was as follows: He lived in Surrey, about twenty miles from London, and had enjoyed good health until June, 1871, when his arms and hands became tremulous, so that very shortly he was obliged to use both hands to raise fluids to his mouth to prevent spilling. He was recommended a change of air, and took a trip to Scotland. After being there a month he got considerably better and returned home. In a fortnight all the symptoms reappeared more severe than before.

He went away again to Southsea, and there used salt-water baths, when he a second time rapidly improved, and at the end of a month returned home. Shortly afterwards, however, the old symptoms reappeared, when he was advised to consult a London physician. He was ordered to use galvanism in the form, he stated, of magneto-electric shocks, which did not benefit him, when his doctor, suspecting lead, had his drinking-water analyzed and found it to be strongly impregnated by lead. He was then, of course, put on a proper course of medicine, desisted from the use of water, and he improved. He had continued the use of the galvanism. He subsequently left London and again went to Southsea.

When I saw him, in March, he had got into a stationary condition and was in the state above described—his limbs wasted and with little power in them. I ordered him some small doses of iodide of potassium and quinine, and wished him to use a simple galvanic current rather than electro magnetism. Finding there would be a difficulty in making use of this at his own house, I advised him to go to Guy's Hospital every morning, and to this he readily assented.

Mr. Sandy, the electrician, tried the effects of the continuous battery-current upon him, and also the induced current, with the following results: In the right arm the extensor muscles contracted well by the application of twenty cells of the Daniell's battery. The induced current was applied, as strong as the patient could bear, with scarcely any contraction. In the left arm the muscles contracted well by fifteen cells and with precisely the same results on the right arm, with the induced or interrupted current. In the legs twenty cells caused good contraction, but scarcely any result was obtained by the interrupted current.

He continued the use of the galvanism to the limbs daily, and made visible progress.

On April 18th he had considerably more power of the limbs than he had a month previously, and, on the muscles being tested, it was found that the "induced" current, which had been powerless before, now excited the extensor muscles of the right arm, so that the hand was raised on a level with the arm. On application of the same strength to the left arm it extended the fingers much more than the right, but the hand was not lifted to the same extent.

The patient persisted in the treatment up to July, during this period gradually improving, and in August he had quite recovered the use of his hands and was following his usual occupation.

Case 4. *Lead Paralysis.*—Margaret C., æt. 47, admitted February 29th, 1872. She has been married and has a large family. Two years ago her husband died, when she was obliged to work for her living. She gained employment in some lead mills, her business being to grind the white lead. For some months past she has been getting thin and feeble, her arms wasted, together with stiffness and pain in the shoulders. Has had slight colic.

On admission: She seems to be a small, spare woman, anæmic and sallow—looking, indeed, extremely ill. She is thin, owing to a general wasting of the muscles of the whole body—more in the extremities, and especially in the arms. She is too feeble to walk, and therefore obliged to keep her bed. She can scarcely raise her arms from her side, owing to the atrophy and weakness of the muscles. The extensor muscles of forearm are extremely wasted, rendering the arm quite flat; the wrists drop down without there being the slightest power to raise them. Muscles of hand soft and flabby, the right arm and hand worse than the left, so that she cannot use them for feeding herself. The blue line on the gums well marked, and a distinct blue stain along the lower lip corresponding to the stained border of the gums. Slight œdema of eyelids. Ordered ten grains of iodide of potassium three times a day. Tested by galvanism. Faradization:

As much power as the patient can bear has a very slight effect upon the extensors of the thumb and not upon the other muscles. Continuous battery-current: Good and well-marked contraction of all the extensors by twenty Daniell's cells. The continuous current ordered. Mr. Sandy finds the more efficient method to be by placing the fingers in water containing a little salt; the negative pole is placed in the water and the positive pole gently stroked along the extensors. This causes contraction of the muscles and elevation of the wrist. When the poles are reversed the current and the effect are less.

April 17th. The continuous current has been used to the limb daily up to the present time, and the improvement has been marked, though gradual. The blue line on the gums is much less. She is out of bed to-day for the first time. As the improvement has been going on, so the muscles have become susceptible to faradization, whereas they have required a larger amount of simple galvanism to affect them.

May 13th. Improved considerably; walks about. Is able to feed and dress herself. Can extend the wrist, and the arms are larger in bulk. Blue lines on gums and lips disappearing. On testing with faradization there is marked contraction in the extensors, the hands being well lifted; this is more so in the left arm than the right, the right being always weaker and smaller.

In this case it may be remarked that besides a well-marked blue line along the edge of the lower gums there was a dark patch on the mucous membrane of the under lip, corresponding in position to that on the gums, but rather more defined and dotted. A question is always asked in the wards whether this mark on the lip is formed independently or follows that on the gums from contact. The latter is the probable explanation.

In these cases of dropped wrist the back of the hand is often observed to be rounded, apparently from enlargement of the metacarpal bones, but due in all probability to some thickening of the thecæ.

Case 5. *Plumbism treated with Electric Bath.*—William J., æt. 36, admitted under Dr. Wilks, July 17th, and left July 27th. He began to work at grinding lead nine months ago, and at the end of about five months commenced to feel ill, with loss of appetite, pains in his head and abdomen, and general debility. He continued at his work and daily grew worse, until a week ago, when he was obliged to desist, having pains in his limbs, sweating and inability to stand, and vomiting.

On admission: He was seen to be very pale and very thin, having evidently lost a great deal of flesh. Skin hot, tongue furred, marked blue lines on gums. Constipation. Recti abdominis contracted and painful.

July 20th. Ordered an electric bath. This was made by Mr. Sandy, as follows: The bath being prepared, enough sulphuric acid was put into it to give it a slight acid taste (about ℥iv); the negative pole of the battery, attached to a large sheet of copper, about two and a half feet square, was put upright in the bath, and the patient placed in it so as not to touch the copper plate; the hand of the patient was held out of the water, and in it he held the positive pole. Fifty and eighty cells were tried, but when the current was applied to the neck instead of the hand, the patient could not bear more than fifty cells. On making and breaking contact the patient felt a kind of thud through the whole of the body. A bath lined with glazed tiles was used.

The patient used the bath again on the 24th, and a third time on the 25th. He said he felt very cold after it. He always had his bowels relieved immediately after it. On each occasion he felt better, and on the 27th he was so much improved that he went out.—*Guy's Hospital Reports*, vol. xviii., 1873, p. 148.

On the influence of the continuous galvanic current over voluntary muscular action, Dr. G. V. Poore, Assistant Physician to Charing Cross Hospital, says:

In the number of the *Practitioner* for September last will be found a paper by the writer on a case of "Writer's Cramp and General Spasm of the Right Arm," which, though of nine years' standing, was successfully treated by the joint use of the continuous galvanic current, and the rhythmical exercise of the affected muscles. For the benefit of those who may not have read that paper, I may be allowed to say that the method of treatment was as follows: A continuous current was passed through a single muscle (such as the deltoid), or a group of muscles (such as the flexors of the wrist and hand); and while the muscles were under the influence of the current, the patient was ordered to exercise them voluntarily. This method of treatment was followed by the best results—results which were surprising to myself and my medical friends.

At that time I offered no explanation as to why this method of employing galvanism proved so serviceable. I was inclined to regard the galvanism as of use merely in overcoming muscular spasm, and attributed to the rhythmical exercises most of the permanent improvement which took place. Since then I have had further experience of this method of employing galvanism, and have obtained some insight into the *modus operandi* of the continuous current when thus employed.

One of the usually prominent symptoms in writer's cramp or palsy is a feeling (more or less intense and more or less unbearable) of fatigue along the muscles of the arm. This may be limited to the forearm, or may extend from the shoulder to the tips of the fingers. I have found that this feeling of fatigue is at once removed by the application of the continuous galvanic current, either along the course of the nerves or the muscles of the arm. One patient, who has suffered very acutely from this feeling of fatigue, has always expressed great satisfaction during the employment of the current, and has frequently used the words "comfortable," and "pleasant," to express his sensations. He has also often said, "*That seems to give me strength, to give me a sense of power in the arm.*" This patient also had a difficulty in supinating the hand of the right arm. There was no true paralysis, and no visible wasting of any of the muscles (though the whole of the arm and forearm was notably flabby, and remarkably non-muscular) but the act of supination was a labored act, and the patient soon tired of performing it.

On telling him to alternately pronate and supinate the hand, these acts were accomplished tolerably well for the first four times, then the act of supination became slow, and was accomplished with an evident effort, and after four or five more attempts it became impossible; and this, as far as one could see, was not due to any spasm of antagonizing muscles. When the supination came to a standstill, I placed the positive sponge-holder of my battery as near as possible over the spot where the musculo-spiral nerve turns forward at the outer part of the elbow-joint, and the negative on the spot where the radial nerve becomes superficial on the radial border of the forearm. The number of elements employed was sufficient to cause an appreciable but not painful sensation to the patient. This seemed to help the supinators over their difficulty, and the patient continued to pronate and supinate his hand without the least trouble, telling me at the time that "he could do it much easier when I passed the current," and also "*that it seemed to give him strength.*" Other muscular exercises were practised with this patient, such as repeated flexings and extendings of the fingers, or of the thumb alone, and he always said that the movements were accomplished more easily, and he got less readily fatigued when a galvanic current was passed through the muscles implicated, or along the nerve supplying them. "It seems," he said, "to give me strength and power." One is not inclined, at least I am not, to pay much attention to the sensations and expressions of a patient; and although my patient was an intelligent man, I thought nothing of what he said until I found another (also suffering from writer's cramp) who said precisely the same thing, "that he could accomplish repeated muscular acts with far greater ease during the passing

of a current, and that after the employment of the current he had a feeling of strength and power in the arm." This latter patient's expression demanded attention, for he was a medical man, and himself accustomed to the employment of electricity. This gentleman suffered acutely from the miserable feeling of fatigue in his arm; and though his muscles are big, and he is decidedly athletic, he soon tires of repeated exercises. This tiring of the muscles and the feeling of fatigue were both obviated by the employment of the current.

From these disjointed observations I got the idea that the passage of the continuous current through muscles, or the nerves supplying them, increases the susceptibility of those muscles to the stimulus of the will, and that their voluntary power is thereby greatly increased.

I proceeded to submit this notion to the test of experiment, and nearly every experiment I have made goes to prove the correctness of my theory.

The first experiment was made upon the patient (H. M.) first mentioned in this paper. I asked him to hold his left arm at right angles to his body, and in the palm of the hand I placed a weight of seventeen ounces. "Now," said I, "tell me when you begin to feel tired, and that you can go on no longer." In about four minutes (the experiment was only tentative and not exact) he complained of great pain in his muscles,—deltoid, triceps, biceps, and forearm,—and declared his inability to go on. I then placed the positive rheophore high up in the axilla, and applied the negative one to the painful parts, when he at once said, "All the fatigue is gone, and I feel as strong as when I began." On the evening of the same day a scientific friend kindly submitted himself to a similar experiment, and the result was the same. When the sponges were applied, he said, "All the fatigue is gone; I feel just as though some one had given my hand a support." I need hardly say that great care was taken not in any way to support the limb with the rheophores; in fact, in these experiments one of the rheophores at all events has generally been as an additional burden to the arm. The current employed has hardly ever been strong enough to produce involuntary contraction of the muscles. My next experiment was made on a student of medicine, Mr. L. S. The result was exactly similar. At the end of seventy seconds he began to make complaints of pain and fatigue, which the current at once removed, and he continued to support the weight for five minutes and a quarter, declaring at the end that if I wished he still could go on, which I would not allow. This was the right hand. We then tried the left hand, without employing any current at all He broke down in considerable pain after holding the weight for two minutes and a quarter. In the evening of the same day he stated that his left hand had been aching all day, but that the right had not given him any trouble. Two days later he tried the right arm again, but without using the current. He managed with the greatest difficulty to support the weight for three minutes and ten seconds, and the effort was followed by considerable aching and pain. On December 6th I asked my patient H. M. to hold the weight in his left hand, and on this occasion no electricity was used. He is a man whose power of endurance is very great, and he managed to sustain the weight for *six minutes*, but endured considerable pain and fatigue while doing so. On December 7th I first galvanized the arm, and then got him to repeat the experiment, and while the experiment was in progress I occasionally passed a current down the arm and through those muscles in which any sense of fatigue or pain was developed. On this occasion he managed to sustain the weight *for thirteen minutes and a half*, a time which I should think few, if any, men could accomplish without aid.

Similar experiments to these have been tried on several of my friends, and they all tend to show that the endurance of voluntary muscular action is enormously increased by the passage of a continuous current, and that the feeling of fatigue, both during and after

the prolonged effort, is mitigated or entirely obviated. It may be that the first result is merely a consequence of the second.

Experiments have also been made, and with results which tend to show that the force, as well as the endurance, of voluntary muscular action is increased by employing a galvanic current. The muscles experimented upon have been the flexors of the fingers, the contracting force of the muscles being registered by the squeezing of a spring dynamometer held in the hand.

The majority of my experiments, typical samples of which I have alone given, tend with greater or less force to show that the force and endurance of voluntary muscular action are both increased by the passing of a galvanic current through the nerves or muscles implicated; but as I have above stated, it is exceedingly difficult to get constant results with the spring dynamometer, and although my experiments with this instrument all tend one way, I do not regard the results as final.

The therapeutic importance of this fact is, I think, considerable, and is likely to lead to the combined use of electricity and voluntary movements in many diseases where there is only partial impairment of muscular power. The case which I published in September is only a solitary example of the benefits of this method of treatment, and is consequently of little value. I may mention, however, that I have two similar cases now under my care which are being treated in the same way, and are making rapid progress. It seems to me better, in all cases where it is possible, to let a muscle react to its proper stimulus,—the will,—than to employ for the purpose of causing muscular contraction a stimulus which is wholly artificial I should mention that the effect of the galvanic current seems to endure for some time after its discontinuance; how long we cannot say; but my patients, if this is worth anything, tell me that their arms retain the feeling of power and strength for about an hour. I am hoping to be able to make further experiments on the effect of a galvanic current upon common sensation.

Some cases illustrating the employment of central galvanization in various sensory disturbances are given by Dr. Thomas Buzzard, Physician to the National Hospital for the Paralyzed and Epileptic in England. He says:

The influence of the constant galvanic current in relieving pain, and often permanently arresting it, in the district of a single nerve or the distribution of a plexus, is by this time well established, although the conditions which affect its success or failure must be allowed to be still undetermined. I have been trying central galvanization lately in a number of anomalous conditions of the sensory organs, as well as in cases of well-marked neuralgia, with a varying result. Out of these cases I propose to cull a few which appear the most interesting, or about which I am in a position to give the most accurate information.

Case 1.—A man, aged 68, had suffered for one year from pain, limited to the region of the two upper divisions of the fifth nerve, left side. The pain was constant, but terribly increased besides by moving in walking, or even driving, or by a current of air. There was also such intense hyperæsthesia of the skin that he could bear nothing to touch this side of his face, which was consequently left unwashed and very dirty. He could not even bear the bedclothes upon it.

The constant current from five cells Daniell-Muirhead—the negative pole to the painful region, and the positive to the nape of the neck—was applied once during three minutes. He was then from circumstances unable to attend the hospital for three months, when

he appeared again, still suffering as described. The current was now applied regularly twice a day in the manner just noted, with a gradual improvement. After six weeks the pain had ceased to be constant, although it still attacked him at intervals, but the hyperæsthesia of the skin was entirely cured. I could touch roughly any part of the affected region.

I would just add here, that although I have not found any marked benefit from galvanism in ordinary toothache, yet for the scarcely less wearisome aching which remains, often for hours, after the extraction of a tooth, the constant current is of extraordinary value. It will generally stop this effectually at once.

Case 2.—A single woman, aged 42, who had been epileptic from 17 to 35 years of age, coupled with violent pain in both parietal regions, occasional loss of memory, and fears about retaining her reason. There was a history of struma in early life, and later a good deal of mental trouble. K. Br. was useful at first, and then failed to relieve her, as did opiates and chloride of ammonium. The pain was intense, coupled with vertigo, tinnitus aurium, flushing of face, besides occasional stammering and subjective sensation of "people talking." She then had the constant current from eight cells Stöhrer through the temples, and also with the positive pole on the neck, the negative on the painful part, two minutes in each direction.

During the application the pain left her. Three times in each week this treatment, without drugs, was continued for six weeks. Sometimes the pain would return as soon as she had quitted the electrical room, at others it would relieve her for a few hours. On the whole, however, she improved; her memory was clearer, she lost some of her discomforts, and became more cheerful. But this did not last, and at the end of this time it was pretty evident that she was in very much the same state as at first. I therefore stopped the galvanism and gave her arsenic, which immediately relieved her much more than anything which had been done.

These were cases of neuralgia.

Case 7.—A single woman, aged 29, had suffered, at the time of her application at the hospital, for two and a half years, from severe pain in the head, as often on one side as on the other. Her appearance was striking from the hair of her head being throughout completely gray, the change in color having commenced when she was seventeen years of age. She had, as might have been expected, a neurotic family history, which is worth giving in detail. One of her sisters, it seems, turned gray at twenty-one and died at forty-seven of "epilepsy." Another sister died between thirty and forty years of age of consumption, and "*her* mouth," the patient said, "was drawn to one side." A third sister is still living, thirty-four years of age, and not at all gray. Six of her brothers died in childhood—one suddenly at seven years of age, one soon after birth, and the others either of zymotic diseases or from some cause which she could not remember. Her mother, still living, seventy-six years of age, suffered during the last two winters from neuralgia. Her father died of dropsy, after rheumatic gout and drinking.

She herself was in good health till four or five years ago, when she became subject to violent headache, which for the last two and a half years had never entirely left her.

The occipito-parietal region of the head was indicated as the chief seat of the pain, which attacked sometimes one side and sometimes the other, and the corresponding arm was described as feeling numb and wanting power during the exacerbations. Digital pressure upon the occipital bone and in the neighborhood of each parietal eminence made her flinch very much. There was nothing in her other organs to call for remark.

Chloride of ammonium, iron and quinine were severally administered without good result, but were often vomited. Chloroform and belladonna were also applied locally

without relief. For three weeks she was injected subcutaneously with morphia (⅙ grain), and with considerable temporary relief, the effect lasting more or less for twenty-four hours. The injection made her quite stupid for several hours, and she slept well during the night following, her ordinary habit being to be awakened repeatedly by the pain. Altogether, she said she had never been so easy as under this treatment.

The constant current, derived from twenty to twenty-five cells of Daniell-Muirhead battery, was then employed, the positive rheophore being applied to the nape of the neck, and the negative to the tender points in turn, the application to each lasting two minutes. Then a rheophore being placed on each temple, a current of like strength was passed for two minutes. This treatment was continued three times a week for three weeks. The patient reported that during the application of the current she entirely ceased to feel the pain, and that generally for two or three hours afterwards there was considerable ease. The alleviation, however, did not last nearly so long as that produced by the morphia injection. A trial was then made of a proceeding which is termed galvanization of the sympathetic. One of the rheophores (a small metallic disk covered with wetted leather) was held firmly in the right auriculo-maxillary fossa, and the other applied to the side of the lower cervical vertebræ, and a current from fifteen cells of Daniell-Muirhead battery allowed to pass during five minutes. This treatment has now been continued for ten weeks, the current being thus applied from three to six times a week. She says that during its application she feels very bad, and as if she were going to die, the sensation being very much worse than that produced by the other electrical treatment. The giddiness persists for half an hour, but there is no faintness. The resulting ease, however, lasts far longer than that which followed the former process, often continuing until the next day. At times she has been a good deal better, and altogether it is certain that she has not had such violent attacks as formerly. On the other hand, she cannot think the relief is permanent, for if she goes a little longer than usual without the treatment, the pain becomes severe. I have now ordered the application to be used to each side of the neck in turn at every sitting.

The process of galvanization just described, it is right to mention, is sometimes attended with more unpleasant results than those which this woman described. Some years ago I was attending a gentleman, aged forty-six, who suffered from epileptoid attacks and a variety of nervous sensations. On one occasion I applied this process to him, employing, however, a much more feeble current—that derived from five cells of Foveaux's battery. I noted before commencing that his pulse numbered 78, and was steady and good. He described himself as feeling better than usual. The application had only been continued during two minutes, when he changed countenance, complained of feeling faint, of a tightness about the brain, difficulty of breathing, and a feeling of sickness. There was an imitation in fact of the feeling which preceded his attacks. I observed that his pulse had lost force and beat more slowly, that his face was pale, and his pupils widely dilated. With the aid of a stimulant he gradually revived sufficiently to leave my house. He did not come again.

I think it is difficult to feel convinced as yet that the process described is really a galvanization of the sympathetic. It must be remembered that the rheophore, when planted in the auriculo-maxillary fossa, is in the immediate neighborhood of several important nerves, and, indeed, is nearer to them than to the superior cervical ganglion. That there is always a considerable diffusion of electricity from the spot to which a rheophore is applied, there can be no doubt. I have frequently observed, for example, that in attempting to galvanize the anterior tibial muscles of the leg in a case of infantile paralysis, the current has been conveyed to the muscles of the calf or the outside of the leg, and caused them to contract. It is impossible to conceive, therefore, that the numerous nerves

which are to be found just below and about the temporo-maxillary articulation can escape at least some of the influence of the current when applied to this region. The important experiments of Brown-Séquard have shown us that galvanization of the sympathetic in the neck causes contraction in the walls of the arteries supplied by its branches. Now, branches from the superior cervical ganglion proceed to the internal carotid, forming the carotid and cavernous plexuses and following the vessels as they branch to their distribution. One of these ultimate branches, the central artery of the retina, is, thanks to the ophthalmoscope, within our ken. If the process described be a true galvanization of the sympathetic, we might expect to see, during its application, some alteration in the size or color of this branch. On one occasion I got Dr. Tibbits, our electrician, to apply the process to the woman whose case I have above related, whilst I carefully watched the fundus oculi of the same side with the ophthalmoscope, employing the direct image as being the largest, and in all respects the most favorable, for this observation. The woman had a large pupil, and the view obtained was exceedingly distinct. There was certainly no change whatever to be observed in the size or color of the artery during the passage of the current, nor after its withdrawal. In the case last described it therefore seems at least as likely, I think, that the unpleasant effects upon the patient were produced by accidental galvanization of the pneumogastric as that the sympathetic ganglion was acted upon. It will be remembered that in 1846 it was shown by the brothers Weber that galvanization of the pneumogastric in the neck caused the pulsations of the heart to become slower, and, if applied in sufficient strength, arrested its action altogether. So again, it is conceivable that in the woman's case the relief she experiences may be owing to galvanization of the auriculo-temporal nerve, and possibly a thence reflected influence upon other branches of the fifth, for the rheophore is at least as near to this trunk as to the superior cervical ganglion.

Respecting the relations of faradic electricity to pain, Dr. Francis E. Anstie, Editor of the *Practitioner*, says:

One of the most important uses of electricity is certainly the relief of pain. And as pain is so common, and often so troublesome a thing to deal with, it is natural that practitioners should eagerly seize hold of what promises to be a new mode of relieving it, without inquiring very minutely as to the precise conditions under which success is most likely to be obtained. The outcome of this indiscriminate employment of the remedy can only be vexatious disappointment in a number of cases, and, in some, a positive aggravation of the sufferings of the patient.

It is time for every one to understand that, in regard to the treatment of painful affections, faradization has very distinct and rather narrow boundaries of usefulness, and these it is now our business to define.

1. Faradization is, in the first place, pre-eminently useful as a *mental counter-irritant* (if we may use the phrase), and therefore will often cure pains of the class vaguely called "hysterical." In the relaxed condition of the nervous tone which belongs to this state, the mere accidental concentration of attention on a particular part of the body will often convert some slightly unusual sensations into the mental perception of actual pain; but this perception is factitious, and can be speedily destroyed by a suitable diversion. For this purpose smart and painful faradization of the skin is well adapted, and it should be applied to a somewhat larger area than that which the hysterical pain occupies. The surface being carefully dried (and, if necessary, powdered), in order to limit the effects as much as possible to the skin, the current is applied with dry metal or carbon electrodes, one pole being placed on an indifferent spot, the other moved slowly about over

the area which we mean to operate upon. The result is, that the mental attention is so scattered and divided among a number of new and sharp impressions, that its morbid concentration is lost, and the sensation of pain disappears. It is very necessary, in the early stages of such cases, to have the electrical apparatus at hand, so that any relapse into the state of actual pain may be promptly dealt with.

2. The pains we have just been speaking of are mainly of a pseudo-neuralgic character; that is to say, they run so far in the direction (or the neighborhood) of recognizable nerves as to simulate neuralgia pretty closely whilst actually present. Those which are next to be mentioned are not distributed in neuralgic areas, nor do they take the form of spontaneous pain, but that of unnaturally heightened sensitiveness to pressure—the so called "hysteric hyperæsthesia." This phenomenon, as is well known, is quite superficial, deep and firm pressure giving less pain than that which merely compresses the skin or mucous membrane (for either may be affected). Here, again, faradization has a most legitimate office; but it needs to be applied with a firm and unsparing hand. Supposing, for instance, that the hyperæsthetic area is on the skin, one uses dry conductors, one being placed five or six inches distant, on an indifferent spot; the other (which should be in the form of the "wire-brush") should be so used as to apply a kind of electrical flagellation to the whole of the affected area. This must be kept up for several minutes with a powerful current; and, if the painfulness of the proceeding becomes intolerable, it is better to give the patient a little chloroform and go on (as Althaus, I believe, first suggested) than to do the thing by halves. It is not often that this procedure fails to cure in one, or at any rate two, sittings; most frequently it is at once successful if properly carried out. If the tender surface be mucous—in mouth, rectum, or vagina—the process is still more disagreeable. We use metal conductors as before, but of course cannot employ the wire-brush to the mucous surface, but a solid disc or button instead, moving that electrode about over the whole sensitive area.

3. We come now to the large class of cases in which the pains are evidently situated either in the muscular or the tendinous structures, and are closely connected with the degree in which the muscle has been over-exerted in proportion to its nutrition. These "myalgic" affections are also frequently in part immediately excited by the action of external cold and damp upon a similarly under-nourished muscle. They are distinguished by the violent exaggeration of the pain which is caused by any movement of the affected part. There can be no doubt that local faradization will very usually remove these pains; the only objection to its use is that for the most part the affection is curable by less troublesome and disagreeable means. The hypodermic injections of morphia, in doses of 1/6-grain or 1/4-grain, locally, or the muriate of ammonia (internally) in 30-grain doses, will often give prompt relief; or Dr. Reynolds's plan, of sewing a piece of oilskin outside the jersey over the painful part, will do the rest. If faradization is to be used, however, it is important to remember that it can only be successfully employed in one way, namely, by strictly limiting its action to the skin. For this purpose we must have the skin very dry, and use dry conductors. If we allow the current to penetrate to the muscle and set up contractions, we shall only add to the agony and render the malady more tedious than it is apt to be naturally.

This brings us to the consideration of a particular class of muscular pains, viz., those caused by sudden laceration of fibre, an accident which is not very uncommon. Fresh interest in the faradic treatment of these affections has been raised by a recent case under Professor Broca, of Paris, although the method is already some years old. The patient got the injury in some playful scuffle, the arm being pushed forcibly (in a direction which is not very clearly stated) while the biceps was contracted; the latter muscle gave way. Local faradization was immediately employed, and, though painful, it immediately re-

stored the power of raising the hand to the head. The reporter (M. J. Lucas-Championnière) remarks on the strangeness of several circumstances connected with these ruptures of muscular fibres. He does not seem inclined to think that the contraction of the muscle itself could produce the accident, but rather (with M. Broca) that the already contracted muscle is torn by some violent wrench in the direction of extension; and is especially liable to this if its tissues be in an unhealthy state. But how comes it, he asks, that a method (faradization) which causes energetic and painful movements of the torn muscle, can at once replace it in a condition to perform the usual voluntary movements without pain? We doubt, however, if this be quite an accurate statement of what takes place. In the first place, we do not think that faradization, *which makes the muscle contract*, is the real agent at work. In a case where we personally used faradization with complete success, the patient had torn a portion of the biceps in holding on to a rope which had a heavy weight at the other end; the machine employed was the common rotatory electro-magnetic apparatus, and one of the ordinary brass handles was grasped by the sufferer, while the other was moved about on the skin over the injured muscle without exciting any notable contraction; yet in a few minutes the arm could be flexed and extended painlessly. The rupture was distinct and visible to the eye. There is also, of course, a probability that muscular fibres which are completely divided, even if their elements be made to contract, would give far less pain than if their attachments had remained entire.

4. There is a somewhat indefinite class of so-called rheumatic pains which appear to be seated in the ligaments of joints, or in the periosteum of bones, occasionally also in the fasciæ. Of course (and more especially under the periosteal group) there is a great danger of reckoning cases that are really syphilitic; but, after careful exclusion of these, a considerable number remain which it is permissible to call chronic fibrous rheumatism. It is very doubtful whether faradization exercises any direct influence on this affection; for our own part we have not been able to obtain any decidedly positive results, and are inclined to suppose that cases which have appeared to be relieved were really of a myalgic nature. One of the fairest instances in which to test the power of faradization would be that peculiarly chronic and intractable affection—rheumatism of the plantar fascia; but it must be remembered that, in many persons, the skin of the sole is so dense and resistant, that there will be no chance of applying the electricity with sufficient penetrating force unless the integument has first been thoroughly macerated with warm water.

5. The great question, however, is, whether faradization is of use in true neuralgia; and to this we believe that a decided answer in the negative must be given. It is easy enough, no doubt, to produce evidence of cures by faradization in what has been called neuralgia by some persons; but it must be remembered that the present tendency of medical classification is to separate true neuralgia very distinctly from the various other pains which have been confounded with it. No pain ought to be called neuralgia unless it obviously follows, on the whole, the track of a recognizable nerve; the affections of this class have a very definite clinical and family history which enables us to identify the disease as clearly as we can identify any malady that exists.

There is ample scope for testing the power of faradization to relieve the pain of genuine neuralgia, since these are common enough, and, in several forms, are so typical that they cannot be mistaken. Personally we have tried faradization over and over again in distinct trigeminal, brachial, sciatic, and cervico-occipital neuralgias, and the general result of our experience is quite clear. In a considerable number of cases, probably the majority, the process only aggravates the pain; and we have known instances in which a neuralgia which, to all appearances, had begun to recede, was at once wakened up and made worse than ever, and more rebellious to the influence of ordinary palliatives than before. In other cases we have seen momentary apparent benefit, which seemed due to

the nervous surprise, so to speak; but such benefit does not endure (as it often does in hysterical pseudo-neuralgia); the pain soon returns again, and, if anything, with increased violence. In other cases, again, faradization has produced no effect whatever, good or bad.

On inquiring further into the matter, there are at least two reasons why faradization would be likely to prove either indifferent or hurtful in the treatment of true neuralgia. If the current does not penetrate beneath the skin, the only effect produced will be a superficial irritation, which might (in a reflex manner) possibly act beneficially if it could be kept up for a long time (as the effect of a blister is), which, however, cannot be done. On the other hand, supposing the current to penetrate more deeply, it is likely to do mischief in either or both of the following ways: if it encounters the nerve, it inflicts upon it the jarring sensation which the very nature of the interrupted current necessarily involves, and which we cannot but suppose must be exceedingly inimical to the restoration of the irregular nerve-action to a state of equilibrium. On the other hand, it is difficult or almost impossible to prevent the *penetrating* current from exciting the surrounding muscles to contraction; and it is well known that the most certain aggravation of neuralgia is produced by the dragging and squeezing of muscular movement; the strongest examples being seen in the effects of mastication in neuralgia of the third division of the fifth, and of certain complicated muscular actions (*e. g.* pianoforte playing) in brachial neuralgia.

The above remarks give a rough outline of the reasons why faradization is generally useless or objectionable in true neuralgia. In that disease it is at once desirable to act on the nerve itself, and yet to act with the greatest gentleness and steadiness. The true neuralgias as we have tried to show elsewhere, involve a real change (it matters little now whether we call it atrophy or rhythmical molecular alteration) in the posterior or sensory root of the nerve, and this state is best combated by such means as tend gradually and steadily to restore the nutrition of the nerve. And, on the other hand, clinical experience teaches us, very positively, that there are no such terrible excitors and aggravators of neuralgic pains as repeated intermittent impulses. The pulsation of a vessel, for example, which presses upon a neuralgic nerve, sends thrill after thrill of pain through it, till at last the torture becomes unbearable, even to a patient who perhaps could endure well enough a constant though severe suffering. Now, the intermittency of the interrupted current is a matter of degree, and consequently the amount of mischief that may be done by faradization varies very much according to the apparatus used and the exact mode of using it. This brings us naturally to the final remarks which we have to make, which concern the question of apparatus.

A fairly good faradizer for those cases in which we desire to inflict a good deal of pain (or at least considerable nervous perturbations), is the ordinary rotatory magneto-electric machine, which, till very lately, has been absurdly supposed, in this country, to be efficient for all electro-therapeutic purposes whatever. There is no question, however, that it does very well for hysterical pseudo-neuralgia and hysterical hyperæsthesia, especially if the patient be made to hold one of the brass handles, and a very coarse wire brush be used as the other electrode, and freely applied to the affected part. But it is usually (except for the mere saving of trouble) better to use a volta-faradaic apparatus—*i. e.*, one in which the motor power is got from a galvanic or voltaic cell; and, for the purpose in hand, a very simple and inexpensive apparatus will do, such as Hearder's "20-power" machine, though of course it is better, if possible, to supply oneself with a thoroughly complete instrument, like those of Stöhrer or of Messrs. Weiss.

In dealing, however, with painful affections by means of faradization, there are more considerations than one to be taken into account in the choice of the apparatus to be used.

Besides mere questions of convenience in application, there is the question, what degree of frequency and regularity do we desire in the interruptions of the current?

As a general rule, it is true that, "in irritation by induced currents, the more rapid the interruptions the greater is the pain produced." The interruptions are rendered more frequent, or lower, by manipulations with screws, which place the interrupting hammer nearer to or farther from the platinum point. But, in dealing with actual clinical cases, it will not be found that the therapeutic facts exactly correspond with this rule. The object being to create intense nervous surprise and distraction, it will not unfrequently be found that, a current of sufficient intensity having been provided, a series of interruptions which is slow on the whole, but has an *irregular rhythm*, is more effective than a mechanically regular series of rapid interruptions. It is not easy to lay down precise rules here, but the following is about accurate as a representation of my own experience: In proportion as the malady is beyond the patient's own control, it is desirable to employ a regular series of intermissions, and *vice versa*. Given, that is to say, a patient with none of the common convulsive phenomena of hysteria, but with some definite paralysis or anæsthesia, and whose skin presents a patch of acute hysteric tenderness; then I advise the use of a tolerably intense current with rapid and even intermissions. The patient should be placed under chloroform, and the dried skin should be well fustigated with the wire brush of a Stöhrer's or a Weiss's faradizer, the secondary current being employed of high strength. But if the affection be of that exceedingly common kind in which the morbidness of the will has much to do with the painful sensations themselves, then it is a good plan to proceed differently. For such patients no chloroform should be allowed; the electrodes should be brass disks, and a common magneto-electric apparatus may be employed. The current being arranged at a high degree of intensity, the driving-wheel is to be urged at a varying and irregular pace; it will be seldom that the morbid sensations do not give way after a few sittings conducted in this manner.

In speaking of the limitations of faradization as a remedy for pain, we have not forgotten, though we have left so far unmentioned, the methods which are called electric pencil and electric moxa, and which aim at producing a more severe and continuous painful impression. Our own experience is decidedly in favor of the abolition of such methods of treating pain; they ought only to be used, we think, for cases in which there is every reason to think that the whole symptoms are mere malingering. If it be really desirable to push the skin irritation beyond the limits already traced, it will be much better to lay aside electricity and resort to the more prolonged and gradual excitement which can be produced by blisters; and if these fail (especially when used in conjunction with hypodermic injections of morphia), we must resort to the constant current. In all the true neuralgias there cannot now be a question that the latter is essentially the right, and the only right, form of electricity to be employed.

As a parting word of insistence upon the necessity for not employing faradization except within its proper limits, we must especially dwell upon one variety of malpractice which has not unfrequently been followed by very disastrous results. We have had occasion to know that in cases of rachialgia (spine-ache) it is not uncommon for practitioners to apply one pole of a common magneto-electric apparatus to the nape of the neck and the other to the sacrum or to the feet (in a water-bath), turning on a pretty sharp current. Such practice is not merely senseless, it may prove very dangerous; for the shock which is thus given to the system is much more serious than that produced by any amount of pain inflicted upon a limited skin area. There is no reason to think that such faradism has any direct effect upon the spinal cord, but in a reflex manner it may have a most serious effect; and the greatest general prostration, or even paraplegia, may be produced. It is really a heavy disgrace to the profession that such utterly reckless proceedings can

possibly occur as some which we have personally known to take place in the supposed electrical treatment of what the practitioner was pleased to call hysterical pains.

A case of trigeminal neuralgia treated with the constant current, is reported by Samuel Craddock, Esq., Shepton Mallet, England:

[The patient was 64 years of age, and was seized somewhat suddenly with severe neuralgia of the left fifth nerve. The foci of pain were situated over the malar bone, and at the junction of the nasal cartilage and nasal bone; also on the brow, over the supra-orbital foramen.]

The immediate exciting cause of this attack appeared to be that the patient had stood at an open window during some damp weather that was prevailing at the time. This gentleman had been the subject of severe albuminuria of long standing; it had, in fact, existed for many years, but there was no evidence of breaking down of the kidney-structure. At the time of the attack the urine was, moreover, very acid, and contained many uric acid crystals; specific gravity, 1025.

The treatment at first consisted in warm fomentations to the face, and the internal administration of alkalies with mild alterative aperients; after a few days he seemed to improve, and the medicine was changed for a mixture containing iron, arsenic, and nux vomica. On October the 26th he went to town, and consulted his London physician, who regarded the attack as due to the gouty diathesis, and put him anew upon alkaline treatment. The patient returned to the country on November 19th, very much worse; in fact, I never saw any one suffer so severely from neuralgia. The lachrymation from the left eye was excessive, and there was a copious flux from the left nostril; the nostril was so exquisitely tender that he could not bear to use his pocket-handkerchief. He complained also of severe shooting pains passing through the interior of the eye These symptoms steadily increased in severity, and the branches of the posterior dental nerve which are distributed to the gums, became affected, as well as the middle dental branches of the supra-orbital; this was indicated by pain referred to the site of the antrum. All the cutaneous branches of the superior maxillary were now alive with pain, and another focus was developed in the upper lip. The sensory part of the inferior maxillary, distributed to the lower lip, followed suit; and at last, so far as one could see, every branch of the sensory portion of the left trigeminus was more or less affected. The patient became perfectly unable to eat anything at all solid, and lived for two months entirely upon liquids; even these he was only able to take through a reed or a glass tube. It is scarcely necessary to enumerate the long list of remedies which were employed; they included the hypodermic injection of morphia and atropia, but the patient could not tolerate these, and the hypodermic method consequently did not obtain a fair and complete trial. The first remedy that gave any appreciable relief was the external application of aconite liniment, which was done morning and evening, and certainly mitigated the pain; meanwhile, however, the lachrymation and the defluxion from the nose continued in full force, as also the tenderness of the parts. Early in February, 1873, I applied the constant current, employing a fifty-celled Weiss's battery. The current was derived from eight cells, and was applied for a period of five minutes at each sitting. The positive pole was placed at the back of the neck, and the negative applied successively to the several foci of pain, being kept steadily on each for a minute or more. This was done daily, at the same hour; after the third application the lachrymation had nearly ceased, and the patient was able to blow his nose freely. From this time the improvement was continuous; mastication was performed easily, and at the end of a fortnight the cure was complete. The patient could not avoid perceiving the remarkable influence of the galvanism, and spoke

of it, with the greatest delight, as a "perfect cure." My own satisfaction was equally great, as I had previously, from inexperience of its use, been inclined to doubt the efficacy of the constant current. This case certainly speaks strongly in favor of this method of treating neuralgia, and incidentally supports the pathological theory of neuralgia advocated by Dr. Anstie in his work on that disease.

[The above case interests me greatly: I regard it as a typical example of the mistakes that frequently result from the time-honored doctrine that neuralgia is usually produced by the gouty diathesis. So long as that theory was acted upon in this case, no really effective steps were taken towards the arrest of the disease, and a very little more continuance in the same course would not improbably have rendered the malady incurable, considering the patient's advanced age. I understand from Mr. Craddock, that there was really no positive reason for supposing that this patient had gout in him; and certainly the mere presence of an excess of uric acid in the urine is no justification for such an assumption. The first remedy that made any impression was the linimentum aconiti, a local application which can only have acted in one way, viz., by temporarily paralyzing the peripheral portions of the nerve, and thus blocking the channels by which impressions from without were pouring in upon the irritated nerve-centre. Aconite belongs to a small class of remedies which are often of great service in procuring a momentary pause, during which neuralgic nerves have time to recover their equilibrium a little, while more radical curative measures can be devised.

As regards the action of the constant current, there can be no reasonable doubt that this was genuinely effective, and I beg to call attention to the fact that the direction of the current was what is called "inverse," viz., from centre to periphery. This is contrary to the method strongly advocated by many writers on medical electricity; but the result corresponds with that of inverse galvanization as seen in several cases under my own treatment. I may especially advert to the case of a footman (described in my book on neuralgia) in whom an exceedingly severe facial neuralgia of the first and second divisions of the fifth was found to be perfectly under the control of the constant current, and the effects of inverse and of direct galvanization were found to be practically identical. I take this opportunity of remarking that evidence is fast accumulating which tends to show that the older ideas as regards the influence of the direction of the current must have been to a large extent erroneous. The opinion of Dr. Reynolds and of Dr. Buzzard coincides with my own upon this matter, and has been arrived at, equally with my own, by sheer experience, in the face of unavoidable prepossessions in favor of the usual ideas as to the respective effects of the two currents.—F. E. ANSTIE.]

The details of electrical examination and treatment in a case of peripheral paralysis of the facial and oculo-motor nerves are given by Dr. Thomas Buzzard, Physician to the National Hospital for the Paralyzed and Epileptic, England.

How far the application of electricity is available in paralysis of the external muscles of the eyeball is a point upon which some doubt is still entertained. In the case which is here related an unusual method of applying voltaism to these muscles was employed with success. Incidentally various points of great interest in reference to diagnosis as well as treatment arose in the course of the patient's illness, and the value of electrical tests was shown no less strikingly than the useful effects of voltaism in bringing back paralyzed muscles to the influence of the will.

I was called, in December, 1872, into the country by Dr. Playne, of Maidenhead, to

see a gentleman sixty-two years of age, under the following circumstances: The patient looked somewhat older than his age, and had been more or less ailing for some years. A year previously he had suffered from some obscure mental symptoms, which had followed prolonged sleeplessness. He was usually dyspeptic, and had experienced pains of rheumatic character. On December 13th he found in the morning that on cleaning his teeth the water ran out of the right side of his mouth, and his face was observed to be drawn over to the left. Next day he could not close his right eye. When I saw him on December 17th, there was pronounced paralysis of the right portio dura. There was complete inability to close the right eye; the angle of the mouth dropped on the right side; in smiling the face was drawn over to the left; and when asked to show his teeth, the lips were scarcely separated on the right side, whilst on the left the teeth were exposed in the usual manner. The aperture of the mouth, under these circumstances, formed an irregular triangle, with its base disposed vertically on the left side. The right eye was painful, and watering from exposure. If there was any impairment of sensibility to touch over the right side of the face, it was very slight indeed. When the conjunctiva of the right eye was touched with the finger-point, avoiding the margin of the lid, although the pressure was perfectly well felt, there was no reflex closure of the lid.

Here, then, were the ordinary symptoms of a peripheral paralysis of the portio dura, and the fact that the patient had been out in his garden on the evening before his attack rather later than usual, and that the weather was cold and damp, combined towards the probability of his suffering from a rheumatic affection of the nerve, or at least from a condition referable to the influence of cold.

I had the opportunity of applying electrical tests. I found that neither faradaism nor the interrupted voltaic current would excite the right facial *nerve*. As regards the facial *muscles* of the right side there was no reaction to the strongest faradaic current which could be borne, but when I applied to them the rheophores connected with a Stöhrer's constant battery, using four cells only, and slowly intermitting the current, I obtained marked contraction of those situated about the angle of the mouth. A similar power applied in like manner to the muscles of the sound side of the face produced no reaction. The sensibility of the skin of the face was decidedly lowered on the right side, especially below the eye, both to touch and to the pain of faradaism. The latter fact was peculiarly well marked. The grasp of both hands was weak, but not definitely unequal, and the patient could raise either leg against pressure equally well. There was no marked impairment of sensibility in his hands, but on inquiry he said that there was slight numbness of the finger-points on both sides. There was no diminution in the power of tasting on the right side of the tongue. There was not then, and there never had been, any weakness in the external rectus muscle of the right eye. I examined the urine, which was pale, clear, acid, and of specific gravity 1013. It contained no trace of sugar nor of albumen. There was general derangement of the digestive functions, with a furred tongue and some diarrhœa. The patient was ordered a quarter of a grain of nitrate of silver, with one-fifth of a grain of opium, twice a day, and an effervescing mixture of citrate of potash and soda, with grain doses of iodide of potassium.

As regards the diagnosis, I thought there were sufficient grounds for believing that the lesion lay in some part of the course of the portio dura. Had it been at the deep origin of the nerve, it was unlikely that the sixth nerve, which (according to Lockhart Clarke) arises from the same nucleus as the facial, in the floor of the fourth ventricle, would have remained unaffected. Moreover, and this was the most important feature, the electric reaction was distinctly that indicating peripheral paralysis. When the facial nerve is paralyzed from central disease, it is, according to my experience, always the case that the

facial muscles retain, either entirely or in great part, their power of being excited by faradaism. On the other hand, the absence of excitability by faradaism and the exaggerated influence of interrupted voltaism were completely characteristic of facial paralysis *à frigore*. I advised, and it was agreed, that treatment by interrupted voltaism should be employed.

On the 7th March, then, nearly three months after the seizure, this treatment was commenced, and afterwards continued almost daily for three weeks. Stöhrer's constant current battery was employed, at first four cells being engaged, then six, and finally eight. One rheophore was placed on the cheek at the point where the facial nerve breaks into its two great divisions, and the other at various parts of the face; but especially often near the ala of the nostril. The current thus employed caused vigorous contractions of many muscles affecting the nostril and mouth. At other times one rheophore was applied near the outer canthus, and then the current caused contractions of the orbicularis palpebrarum muscle. Each sitting occupied about twenty minutes. One rheophore was lifted and reapplied at tolerably regular intervals of about thirty or forty in the minute. During the first week the change effected by this treatment, although at once apparent, was not very marked; but afterwards improvement was noticed daily. On March 28th, when the patient returned into the country, the cheek no longer bagged; the lower lip kept closed, instead of falling and showing, as it had done, the lining membrane, over which saliva trickled; the eye could be very nearly closed. Nor was this improvement altogether the result of a secondary contraction equivalent to that so often seen in the paralyzed muscles in a case of hemiplegia, for a very considerable power of moving the mouth by voluntary effort returned. The nerve-twigs to the occipito-frontalis muscle must, I think, have escaped injury. At all events, when I tested the frontal part of this muscle a few days after beginning the treatment described, I found that it responded readily to the faradaic current when one rheophore was placed over the emergence of the portio dura and the other on the muscle. It was also capable of being contracted by voluntary effort. Nearly two years had elapsed when I was again, on May 28th, 1875, summoned to see this patient. I found him in his bedroom, sitting up, with his back to the light, which his left eye was quite unable to tolerate. So much photophobia was there that I had to refrain from turning his face to the window whilst I examined him. The left eye was closed by ptosis of the upper lid, but the patient could, by a strong voluntary effort, open it, though the lid immediately afterwards fell. There was intense pain, referred to the ball of the eye, and also pain, together with tenderness on pressure, upon the left parietal bone, near its junction with the frontal. He had double vision, the images being crossed—that to his right belonging to his left eye. In order to avoid the confusion and giddiness caused by this diplopia, he was wearing a shade over the left eye. I found that there was partial paralysis of the branches of the left oculo-motor nerve, going to the levator palpebræ superioris, the internal, superior, and inferior rectus muscles. It seemed that the patient had been exposed to a great deal of domestic trouble and anxiety, with the result that his appetite and digestion had failed, and a few days before I saw him, he had complained of double vision. It appeared also that several decayed teeth, which had been troubling him for some time, had interfered with his power of taking sufficient nourishment. I advised some chloride of ammonium, which seemed to have a good result as far as the pain in the eyeball was concerned. A fortnight later, however, I found that, whilst he had ceased to feel pain in the globe of the eye, the paralysis of the muscles before referred to as partial had become complete. There was complete ptosis, and absolute inability to turn the left eye either upwards, downwards, or towards the nose. The symptoms indicating an affection of the left third nerve, which might be accompanied or caused by some effusion in its

sheath, I advised a trial of iodide of potassium, although very doubtful whether it would be tolerated. In effect, the first dose so upset the patient's stomach that he could not be induced to try another, and Dr. Playne then prescribed some quinine, ammonia, and gentian. This answered very well; the appetite and general health improved, and when the patient came to town on July 7th, I found him looking much better than he had been. There was still, however, ptosis of the left eyelid. He could, when requested, lift the lid to a certain extent by a manifest effort, but it was immediately dropped. The vision of this eye not being absolutely occluded by the state of the lid, he was forced to cover it with a shade, as otherwise he was so embarrassed by diplopia that he could not walk without staggering. I found the recti muscles greatly wanting in power, but not, I think, quite so incapable as when I had last seen him. However, the eye was turned outwards constantly, and although, by a strong voluntary effort, it could be carried a very little way towards the nose, and a still less distance upwards and downwards, it was practically fixed in a condition of external strabismus, and was useless for optical purposes.

Guided by my experience of the result of interrupted voltaism in the facial paralysis of the opposite side of the face more than two years previously, I thought it likely, now that acute symptoms had subsided, that a similar mode of treatment might lead to good results in restoring the action of the muscles of the eyeball which were paralyzed. Instructed, too, by former experience, I felt that faradaism was not the treatment proper for the condition. The muscles of the right side of the face had quite failed to respond to faradaism, but they were excited by a very mild voltaic current when it was slowly interrupted. So it seemed likely that a mild and interrupted voltaic current was indicated in the present condition. The best mode of applying this was not so evident. When metal rheophores covered with wetted kid were applied to the closed lids, and a current of varying strength employed, either the electric influence was unfelt or it was painful to the skin. There was difficulty, too, both with these rheophores and also with sponges in applying the stimulus exactly where I wished it. I now bethought me of using the finger as a rheophore, and tried it in the following manner: An assistant having applied to the patient's left temple a sponge rheophore connected with one (it was not material which) pole of a Stöhrer's constant current battery, I grasped in my left hand another sponge rheophore coming from the other pole, and then applied the forefinger of my right hand, covered with a single thickness of muslin wetted with pure water, to the right upper eyelid of the patient. The battery was Weiss's (Foveaux's), which had considerably run down, so that it was perhaps only half-strength. Cautiously increasing the number of cells (it was long before any electric sensation was felt), I found that the current from between 30 and 40 cells could be employed in this manner, my body, through which it was bound to pass, offering a great resistance, and serving indeed as a rheostat. The application was made through the closed lids. The finger proved an exceedingly convenient rheophore. I could apply exactly the amount of pressure desirable, and could reach portions of the globe which it would have been exceedingly difficult to act upon in any other manner. Moreover, the strength of the current could be gauged at every instant. That which was employed was just sufficient to cause me to feel a distinct shock in the knuckle of my right forefinger every time the current was interrupted. Occasional flashes of light were observed by the patient, but he felt no pain. We thought we could see a little improvement in power after the first day's application, but there was no doubt of this at all at the close of the second sitting. Not to weary with a daily record, I may say that this treatment was applied on fifteen occasions in all, the applications extending over a period of three weeks. The time occupied at each sitting was from twenty to thirty minutes. A daily increase in power of the muscles was noted, and when the patient returned home, after the last application, he was absolutely well. The

lid was entirely under control, and the movements of the left eye were in every respect perfect. Of course, therefore, there was no longer any double vision, and the use of the shade was discarded. The patient has since remained quite well.

Remarks.—I need scarcely say that it is a matter of the gravest import, as regards the prognosis, whether a paralysis of the facial muscles is diagnosed as peripheral or as depending on a lesion of the central nervous system. The importance of this is increased when the patient, as in this case, is a man who has passed the middle period of life; and becomes intensified when, as occurred in the instance which I have described, paralysis of one side of the face is followed by loss of power in certain muscles of the eye on the opposite side. The general conditions, the patient's age, his weak state of health, his family history, all combined to give a very serious aspect to his case, which even his complete recovery would not of itself suffice to counterbalance. For it is quite conceivable that a man of this age, and with such a history, might suffer from a central nervous lesion, possibly small hæmorrhages, which could be repaired, and the paralytic symptoms be *ipso facto* removed, and yet that he might be left in a state peculiarly prone to the repetition of attacks which might at any moment involve districts where the occurrence of lesion would have a serious influence upon life. The mere fact, therefore, of this patient's complete recovery does not of itself bear conclusive testimony to the peripheral character of the affections from which he suffered. The electric reaction, however, of the facial muscles paralyzed in the first attack lends complementary evidence of a kind sufficient, I believe, to enable us to say that not only was that attack certainly dependent upon a lesion of some part of the facial nerve, not of the nervous centre, but that in all probability the second attack was of similar character. Experience, which by this time has been sufficiently universal to make its results positive, teaches us that when there is paralysis of facial muscles, and these a few hours after the attack show a diminution, rapidly going on to an entire abolition of contractility on exposure to induced currents, whilst contractility is effected with abnormal facility by the interrupted voltaic current, the lesion is not a central one, but involves some portion of the portio-dura nerve. I have seen no exception to this rule. The lesion may result from cold, from wound of the nerve, or from compression, but it is always a lesion of the nerve, and not of the nervous centre. It was with great confidence, therefore, that when the test applications of the induced and voltaic currents in this case were followed by the results described, I pronounced the facial paralysis to be of peripheral origin. When, in process of time, the second attack occurred, involving on this occasion the oculo-motor nerve of the opposite side, although in the nature of things the application of electrical testing was not practicable, it was not unreasonable to infer that this also depended upon a similar cause to that which had caused facial paralysis two years previously, especially as isolated paralysis of one oculo-motor nerve is almost always peripheral. I ought especially to say that there was good reason to exclude the probability of syphilis in this case, and that there has not been any sign of gout. My prognosis was accordingly favorable, as regards the question of the site of the lesion, although I could not properly give any decided opinion upon the question whether the paralysis would be recovered from or remain permanent. I inclined, however, to the more favorable view, and thought that electrical treatment would be likely to assist recovery.

The voltaic instead of the faradaic current was chosen, then, because the paralysis of the eye muscles, like that of the facial muscles, was deemed to be of peripheral character. It seems likely, especially from the researches of Schiff, that induced currents do not determine directly the contraction of muscles, but only act through the medium of the intra-muscular nerves. When these are damaged, as by the influence of cold, the power of causing contraction of the muscles by faradaism ceases. Not so, however, as regards

the interrupted voltaic current, the influence of which is now much more marked than it is in healthy striated muscle. Dr. Onimus, of Paris, in some interesting papers which have lately appeared, expresses the opinion that in cases of paralysis of the facial nerve the muscles, although they do not atrophy, pass into a condition in which the contractile substance resembles rather smooth muscular fibre or protoplasm than normal striated muscle. He reminds us that continuous currents have a much more marked action upon smooth fibres than induced currents, and to provoke the contraction of the unstriated fibres a current of much less intensity is required than for striated muscles. And as with normal smooth fibres, so also with those striated fibres which, from an injury to the intra-muscular nerves, have acquired much of the character of smooth muscular fibre. In this mode, Dr. Onimus explains the remarkable difference between the action of the induced current and that of voltaism in cases of facial paralysis, as well as the curious fact that the voltaic current acts much more energetically in such cases than in the healthy condition. In the case above related, it seems probable that the branches of the portio dura distributed to the muscles, and not to the trunk of the nerve itself, were affected. For the occipito-frontalis muscle escaped, and this omission, which is easily explained if the lesion be supposed to be located in a number of nervous twigs, some of which elude the hurtful influence, presents considerable difficulty if we imagine an injury to the trunk itself. Moreover, the sense of taste was preserved on the affected side, which suggested that the lesion was at least beyond the point where the chorda tympani is given off. The impairment of the cutaneous sensibility, which was certainly more marked than I am in the habit of finding it in such cases (there is often a little numbness), is probably to be explained by a localized influence upon the branches of the sensory nerve (fifth) similar to that exerted upon those of the portio dura. The exact effect upon the muscles, which was brought about rapidly by the influence of voltaism, I do not find it easy to explain. It would seem—and this point is extremely interesting—that if we cut off the influence of the will from striated muscular fibre, the structure tends to degrade, and, as regards its function, passes into a state closely resembling that which is characteristic of involuntary muscular fibre. The resemblance is threefold: the fibre is no longer contracted by the influence of the will; it is acted upon by voltaism when faradaism fails to affect it; and the action of voltaism upon it is much more marked than upon healthy striated muscle. Apparently the effect of applying voltaic currents to muscular fibre so degraded is to lead it back to its normal condition. It often happens, as it did in this case, that the will acquires its power to cause contraction of the recovering muscles before they will respond to the influence of the induced current, but after they have ceased to be abnormally excited by voltaism. When this occurs, it is probably only a question of time as to when faradaism will be able to exert its ordinary stimulating power once more. When I last tested this gentleman's facial muscles, a few weeks ago, I found that voluntary power over them was restored perhaps to three-quarters of the normal extent, that interrupted voltaism affected the injured in no higher degree than the uninjured side, and that the influence of the induced current had again become manifest, though not quite perfectly. I suppose that voltaism replaced the action of the will, as far as concerned the preservation of the muscular fibres, till such time as the intra-muscular nerves had recovered and allowed the passage of the volitional influence. The circumstance that the face has not entirely recovered is, doubtless, owing to the injury to some of the muscular nerves having been irreparable. There is nothing, it seems to me, in such examples as this, which requires one to fall back upon an electrolytic action of voltaism upon the constituents of the nerve-trunk to account for phenomena which are to be explained more easily in the manner described. I think that the very rapid clearing up of the oculo-motor palsy (in the second attack) under the influence of voltaism goes far to prove that the lesion in this, as in the

other paralytic seizure, was of a superficial character. The injury at the time electrical treatment was commenced was probably to a great extent repaired, but the muscles which had been cut off for a long time from the stimulating influence of the will had degraded into a state approaching that of involuntary muscular fibre, and were incapable, therefore, of being acted upon by volition to any effective purpose. The few applications of voltaism restored the muscular fibres to their natural condition, and they became both physically and metaphysically "voluntary."

The use of the hand as a rheophore is not new. It has been employed by many for the application of faradaism, especially to the spinal column. But, as far as I am aware, the use of the finger in the manner described for applying interrupted voltaism to the eye muscles is novel. It is certainly very convenient. What we want in such a case is a large quantity of electricity of low tension, and this is, I think, especially well arrived at by interposing the operator's body in the course of the current, and employing a considerable number of cells.

Respecting the treatment of certain forms of paralysis by galvanization and faradization, Dr. Julius Althaus, Physician to the Royal Infirmary for Diseases of the Chest, London, says:

[There are only two forms of current required for therapeutic purposes, viz., the induced or interrupted electro-magnetic and the continuous galvanic current, the methodical employment of which has been termed respectively "faradization and galvanization." Frictional electricity possesses no peculiar advantages, while the magneto-electric current is decidedly inferior to the electro-magnetic.]

The double-current induction machine and the modification of Daniell's battery, both constructed according to my directions by Mr. Becker, of the firm of Messrs. Elliott Brothers, of St. Martin's Lane and the Strand, are sufficient for all practical purposes. The former of these apparatuses is similar to the induction machines which are now in general use on the Continent, whilst the constant battery just mentioned is, for beauty and efficiency of arrangement, superior to any that have hitherto been contrived. In those constant batteries which have until now been used by medical men, the great drawback has been the presence either of nitric, sulphuric, or chromic acid, which not only after a time destroy the battery, but also entail considerable variations in the power of the current and much loss of time on the part of the operator. It was, therefore, desirable, in the construction of a battery suited for medical practice, to dispense with acids altogether in order to render the current as constant as possible and to avoid inconvenience and loss of time. For these reasons the machine mentioned is only charged with water and a solution of sulphate of copper, with the result that, after having been once put into action, a constant current is obtained which continues reliable for about six months, even if the battery is daily used. No acid being present, the cast zinc cannot be destroyed, and remains quite unchanged. After the lapse of the period mentioned the deposit of copper must be removed from the zinc plates and a fresh solution of sulphate of copper be substituted. If this be occasionally repeated the battery will last for any length of time, while most constant batteries, when daily used, are destroyed in about a twelvemonth, and some even in so short a space as six weeks. Another advantage of the absence of acid in this battery is that the current gains in quantity while it loses in tension, and can, on this account, be safely used for acting on the centres of the nervous system.

The physical relations and the chemical and physiological effects of the continuous and the interrupted current are widely different from one another, and it may, therefore,

be inferred that each one of them has also its own special sphere of action in therapeutics. The continuous current, which is produced by the chemical action of two heterogeneous conducting bodies, moves always in the same direction and has considerable chemical effects, as it easily decomposes water and saline solutions, oxygen and acids being attracted to the positive pole, while hydrogen and alkalies accumulate at the negative pole. Induction currents, on the contrary, are of instantaneous duration, move alternately in contrary directions, and have, therefore, only a slight chemical action, for, as each wire serves alternately as positive and negative pole, their chemical effects are, in a great measure, neutralized as soon as produced. As regards the difference in the physiological action of the two currents, it may be laid down as a fundamental principle that *the induced current only acts on the parts directly submitted to its influence unless a very high power be used, while the continuous current, by reflex action, also affects distant parts, and more especially the centres of the nervous system.* As this is a new proposition, it will be necessary to adduce proofs in order to establish its correctness.

If the induced current is, by moistened conductors, applied to the face, it causes a peculiar sensation and contraction of the muscles, while the continuous current, if applied in the same manner, not only causes a peculiar sensation and a contraction of the muscles both at its commencement and at its cessation, but also a vivid flash of light, and if the current be one of some force, even sickness, giddiness, and fainting may ensue. These latter phenomena, which are caused at whatever part of the face or nape of the neck the current may have been applied, can only be explained by assuming the physiological transmission of part of the current to the encephalon. There are also facts to prove that the continuous current has a physiological action on the spinal cord and the sympathetic nerve if applied to the skin of the back by moistened conductors. Thus we may often cause the iris to contract by directing a current of large quantity to the lower cervical and upper dorsal vertebræ, showing that there is physiological transmission of part of the current to the cilio-spinal region of the cord and the corresponding ganglia of the sympathetic which preside over the functions of the iris. Again, by applying a continuous current to the lumbar portion of the spine we may cause a glow in the legs and feet without any direct application to these latter, showing that the influence on animal temperature, which M. Claude Bernard and Dr. Brown-Séquard have proved to belong to the sympathetic, is brought into play by the application of the continuous current. These facts would appear sufficient to establish the correctness of the proposition with which I started, viz., that the continuous current is capable of influencing, by reflex action, the centres of the nervous system,—both cerebro-spinal and sympathetic, while the induced or interrupted current has no distant, but only local and immediate effects.

The therapeutical experience I have gained in various forms of paralysis with both kinds of current, entirely coincides with these physiological premises. It is to the effect that the interrupted current proves useful in local paralysis, due to injury of the motor nerves and muscles, to pressure, rheumatic effusions, poisoning by lead, etc., but can have a beneficial influence in paralysis from diseases of the nervous centres only after the original lesion has subsided, and in reflex paralysis only after the irritation in the spinal cord has passed off. The continuous current, on the other hand, proves efficient in certain forms of paralysis due to affections of the nervous centres, more especially in those cases which are caused by effusion in the spinal canal and incipient softening of the cord, as well as in most instances of reflex paralysis where irritation of the cord is still present.

[The author illustrates the therapeutical use of galvanization and faradization in paralytic diseases by a short series of cases which have been under his care in private and hospital practice.]

I. Faradization.

1. *Cerebral Paralysis.*—Faradization is useful in cases of hemiplegia after the complete formation of the apoplectic cyst, when there is no longer any irritation within the cranium; where the speech is little or not affected; where there is not much or no muscular rigidity, but where the arm and leg remain nearly or entirely useless.

Case.—A gentleman, aged 45, had an attack of hemiplegia of the right side, in June, 1863. I was consulted in April, 1864, when there was complete loss of power in the arm and only slight recovery of power in the leg, the patient being just able to walk a short distance with the aid of another person's arm. Articulation satisfactory; no rigidity; nutrition in paralyzed limbs much below par. Faradization for six weeks, after which the patient could write, dress, and feed himself, and walk a couple of miles, with the aid of a stick, without much inconvenience.

2. *Paralysis of the Portio Dura.*—Where this is due to rheumatic effusions in the sheath of the facial portion of the nerve or in the muscles themselves, faradization is a very certain remedy, more especially where the contractility of the muscles is lost or diminished. On the contrary, where the intracranial portion of the nerve is suffering, a continuous current of low tension (from five to fifteen cells of the battery previously described) proves more useful. This latter often causes contractions of the muscles where a powerfully induced current fails to do so.

Case.—A lady, aged 42, was affected with left facial paralysis in January, 1862. She consulted me four months after the commencement of the affection, when the only muscles which had recovered their tone, to a certain extent, were the frontal and corrugator, but all others were still completely paralyzed. Uvula straight; no deafness. Faradization for a fortnight. Improvement after the first operation. Cure at the end of the second week.

I have treated a number of cases of intracranial paralysis of the portio dura by the aid of the continuous current, but as in every one of them other active remedies were administered at the same time, I will not give any particulars, but merely say that there was no doubt about the beneficial effect of galvanization in these cases, not only with regard to the gradual recovery of power, but also to the relief of pain, which is scarcely ever absent.

3. *Rheumatic Paralysis.*—Cases of loss of power in the extremities, arising from exposure to damp and cold, even if of a severe kind and of long standing, are generally cured by faradization, which also relieves the muscular pains, which are sometimes very severe.

Case.—A gentleman, aged 37, having been much given to fishing and hunting, suffered for three years from great pain and loss of power in the upper as well as the lower extremities, which he himself attributes to continual exposure to the weather. I saw him in October, 1858, when there was much wasting of muscular tissue, especially in the right deltoid and the extensors on the back of the forearm. No signs of central disease. The urine has been very thick, but is now normal. After five weeks' faradization the patient recovered.

4. *Paralysis from Pressure on Nervous Plexuses.*—Cases of loss of power from continued pressure, especially of the head on the arm during intoxication either by chloroform or alcohol, are generally curable by faradization.

Case.—A lady, aged twenty-three, had her first confinement in November, 1864, during which she was for some time under the influence of chloroform. While in this condition her head rested heavily on the left arm, and pressed so much on the brachial plexus that a number of muscles animated by the latter became entirely paralyzed, there being also complete anæsthesia of the left arm. I saw her in January, 1865. The affection

was most severe in the muscles of the forearm, the patient being quite unable to lift the wrist, which was much swollen, and had to be bound up with a splint. As she also complained of great weakness in the other limbs and the back, I combined the use of a continuous current of fifty cells to the spine, with faradization of the left shoulder and arm. After six weeks of this treatment, the patient felt very much stronger generally, and had entirely recovered the use of the left arm.

5. *Paralysis from Interrupted Continuity between the Spinal Cord and Motor Nerves* (*Dr. Marshall Hall's Spinal Paralysis*).—Where the connection of motor nerves with the spinal cord has, by external violence, been interrupted, a period varying from six to twelve months is required for re-establishing nervous conduction. The two cases recently published by MM. Nélaton and Laugier, which would seem to throw doubts upon this point, are, in my opinion, not sufficient to make us give up the above proposition, which has been deduced from most careful clinical observation of a very large number of cases, as well as from physiological experiments on animals. Experience shows that faradization soon or immediately after such accidents is useless, and does not even prevent atrophy of the muscles deprived of their connection with the cord. On the contrary, if resorted to from six to twelve months after the accident, faradization frequently restores the power to the paralyzed muscles.

Case.—A porter, aged thirty-two, suffered compound fracture of the right arm and other injuries from being run over by a van in December, 1860. After three months the fracture was healed but the arm remained useless. He was sent to me in May, 1861, when I found complete anæsthesia, paralysis, atrophy, and loss of electric contractility of the muscles from the acromion downwards. I recommended him to do nothing for three months, and then to present himself again. This he did in the October following, when he appeared to be much in the same condition. I then commenced the faradaic treatment, and after about four months, the patient attending every other day, he had, to a great extent, recovered the use of the arm, although it was still much weaker than previous to the accident.

6. *Reflex of Paralysis.*—In cases of this kind, faradization proves beneficial after the irritation which, by its transmission to the spinal cord, caused the paralysis, has subsided, but where paralysis nevertheless continues. In other cases faradization or galvanization may remove the irritation, and thus prove curative. For cases see my work on Paralysis, Neuralgia, etc., pp. 155-158.

7. *Hysterical Paralysis.*—Where this affection occurs in only one limb, or a particular set of muscles, faradization of the suffering parts is of use, but where it appears in the form of hemiplegia, paraplegia, or general paralysis, galvanization of the nervous centres is more effectual. (See a case of this description in the *Lancet* for February 18th, 1865, p. 175.)

8. *Lead-Palsy.*—In paralysis from poisoning by lead, good results are generally obtained by faradization, even in severe cases, and after muscular atrophy has set in.

Case.—A painter, aged thirty-three, had for more than a twelvemonth suffered from weakness of sight, colics, and dropping of both wrists. He had had a long course of iodide of potassium, under which he somewhat improved, but not one of the symptoms was entirely removed. I saw him in November, 1864, and treated him by galvanization of the optic nerve and abdomen, and faradization of the suffering muscles. Within a month he was so much improved that he could be discharged.

9. *Progressive Muscular Atrophy.*—There are two forms of this disease—viz.: the partial, which begins in the hand or the shoulder, and does not affect any muscles but those of the upper extremities; and the general form, which may destroy nearly all the voluntary muscles throughout the body, and is mostly fatal. Cases of the former affec-

tion are curable by faradization; and such of the latter kind may be considerably improved, and their course be arrested by a combined use of faradization of the muscles and galvanization of the nervous centres, if resorted to at an early stage of the disorder.

CASE.—A gardener, aged twenty-five, became, in consequence of overwork, very weak and lost flesh in the right arm and shoulder, in August, 1863. During the following two months the affection spread to the forearm and hand, and he was then quite unable to follow his employment. He was sent to me in December, 1863, when I found atrophy of most of the muscles of the right upper extremity. Faradization for nearly five months, after which the power of the muscles had so much increased that the patient could return to his occupation.

10. *Paralysis of the Vocal Cords.*—As Dr. Morell Mackenzie has lately published a number of cases of aphonia due to a paralytic condition of the vocal cords, and successfully treated by faradization, I will only say that my experience in this particular quite agrees with that of Dr. Mackenzie.

II. GALVANIZATION.

1. *Cerebral Paralysis.*—In certain cases of cerebral paralysis with intracranial irritation, a cautious use of the continuous galvanic current proves of decided benefit, in allaying pain, spasms, and muscular rigidity. I abstain from giving cases of this description, as in every one of them which have fallen under my notice, other remedies were administered at the same time. The continuous current is likewise useful in cases without pain and spasm, but when the speech is much affected and the paralysis of arm and leg continues; and it can be safely employed about six months after a seizure.

2. *Ptosis, Double Vision, and other Paralytic Affections of the Third, Fourth and Sixth Nerves, and of the Iris.*—In these conditions, even if they are caused by encephalic disease, the continuous current, cautiously and gently applied, may produce very striking results. For the majority of such cases, five or ten cells of the battery are quite sufficient, and the operations must be very short; for long and strong applications only do harm. An able and elaborate paper on the subject by Dr. Benedikt of Vienna, may be found in Von Graefe's *Archive für Ophthalmologie*, 1864, vol. x., part i., p. 97.

CASES.—A gentleman, aged forty-nine, had for ten months suffered from ptosis of the left eyelid, for which he had undergone a variety of treatment without benefit, when he consulted me in December, 1864. There were many other symptoms exciting the suspicion of encephalic disease. Galvanization by five cells, for not more than half a minute each time. Within the fortnight he had recovered the power over the eyelid, although there was no improvement in the other symptoms.

A lady, aged forty-five, suffered from mydriasis of the right eye. She was otherwise in good health, and unable to account for this affection. She was sent to me in July, 1862. Galvanization by three cells of Bunsen's battery, with immediate improvement during the first operation. She left town after four operations, much improved.

3. *Incipient and Progressive Softening of the Spinal Cord.*—In this affection good results may be obtained by the application of a powerful continuous current, of from fifty to a hundred cells of Daniell's battery, to the spine. Such operations, when judiciously performed, evidently exercise a direct influence on the nutrition of nervous matter. In the late stages of the disorder—that is where actual destruction of nervous matter has taken place—of course no benefit can be obtained.

Dr. Drescher, of Reinerz, reports in the *Allgemeine Medicinische Central-Zeitung*, for January 22d, 1868, a case of the recovery of a

man struck by lightning, in which very singular markings were produced on the body by the lightning.

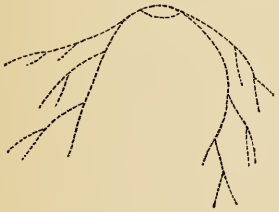
The man was sitting with his back against a wall. When struck, he sank unconscious to the ground, and seven minutes afterwards, when first seen by Dr. Drescher, he had ceased breathing entirely, and his pulse was almost imperceptible. The skin was cold, the countenance pale, the eyes half closed, and the mouth open. Frictions were made on the face, neck, breast, and back; and a vein was opened, from which blood flowed, although at first very slowly. The first obvious respiration was now made, and gradually the skin became warmer, and color returned to the face. Half an hour after the accident, the patient began to moan, and at the end of an hour he had fully recovered consciousness, but was unable to swallow or to speak above his breath for half an hour more.

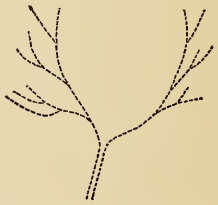
He now began to suffer the most violent pains, accompanied by intermittent convulsive movements in the flexors of the extremities. These gradually, in the course of an hour, fixed themselves in the forearms, and wrung from the patient loud screams. He described the feeling to be as if his arms were being torn off at the elbow. These pains were worse first in one arm and then in the other, but finally fixed themselves in the left arm, became endurable, and at last ceased almost entirely after about thirty-six hours, leaving, however, the general sensibility of the skin diminished.

During eight years before, the patient had at intervals suffered from an obstinate intermittent fever, from which, however, he had been for a long time entirely free; but eight hours after having been struck by lightning, he had a regular attack, which was repeated two days afterward, at which time the pains in the forearm returned with considerable violence.

Quinia, morphia, and wine were the principal medicines given.

The marks on the body began at the first cervical vertebra, from which they spread in four directions. Two branches passed around the neck, one on one side and the other





on the other, gave off branches on each shoulder, and then spread themselves all over the thorax; two other branches went over the scapulæ towards the axillæ.

All the lesser branches had a downward and outward direction. The color was a coppery brown, which from time to time changed to one a little lighter.

From the sacrum another line, an inch wide, ascended. It had the same color as the descending one, and branched off similarly; the branches of the two meeting on the back just below the scapulæ, and on the abdomen above the umbilicus.

On the extremities there were only rudimentary indications of markings, which were a little more evident on the left arm than elsewhere.

The separate points shown in the engravings were as clear as if the patient had been tattooed.

All the markings disappeared within thirty-six hours.

CHAPTER XXXI.

SPINAL CONCUSSION—ITS MEDICO-LEGAL RELATIONS AND SIGNIFICANCE.

In this chapter I propose to treat of a class of injuries to the cerebro-spinal nervous system, where the effects are, as a rule, remote rather than immediate, and which, in many instances, affect the *mind* quite as seriously as the body.

The immediate constitutional state after an injury to the spine may be one of prostration and shock to the nervous system, in which we find our patient perhaps partly unconscious, with a feeble pulse and imperfect respiration. There may be complete syncope, with the pulse and respiration not perceptible, or the nervous instead of the vascular system may be principally affected, and the patient may be incoherent or perhaps comatose. Nausea, vomiting, suppression of urine, and convulsions, especially in children, may occur. The local effects in injuries of the back are not included in the scope of this chapter, and comprise wounds, contusions of every kind, fractures, and dislocations. Injuries to the backs of children may occur from blows or falls, without any obvious lesion of a mechanical nature occurring, and, after some time elapsing, we shall see our little patient complaining of a good deal of pain, and upon examination we shall discover redness and swelling in the tissues, and with the history of a fall or blow on the back we can at once diagnosticate the existence of caries. Finally, in these cases, an abscess forms, and after our incision, to let out the pus, we shall easily feel the carious bone with our probe. The abscess leaves fistulous openings, from which there is more or less sanious pus discharged, and the fistulous opening is surrounded by unhealthy granulations.

These cases occur from injuries to the back much more frequently, I think, than is imagined by the profession. In a violent injury to the back of an adult, the shock is the first thing that occurs, and our patient may die immediately, with no apparent mechanical lesion. If our patient survives the shock, inflammation sets in and our patient may develop a meningitis. The symptoms of severe concussion are pallor of the face, the respiration gasping and afterwards becoming nearly normal, pupils dilated, difficulty in swallowing, pulse feeble and perhaps slow, and the consciousness muddled. The patient might appear to be feigning. We may possibly have unconsciousness.

In these most severe cases the cord is contused, and if our patient dies and we make an autopsy, we may find a little red point of extravasation.

In these cases we should use for stimulants carbonate of ammonia or alcohol moderately, with bags of hot sand to the body, with friction. Hypodermics of $\frac{1}{100}$ grain of sulphate of atropia are also indicated as the most energetic heart and respiratory stimulant. When our patient recovers from the immediate shock, he will have confusion of ideas. He may have nausea and vomiting, which are good signs, as, when the injury is very severe, our patient will not vomit, and he *may* not if the injury is very slight. If the brain is implicated, as it may be, and there is no compression, we shall find dilated pupils, a comatose condition, the respiration stertorous, and the cheeks and the alæ of the nose moving at each movement of respiration. The velum palati is paralyzed, and there is rattling of mucus in the throat. The pulse is slow and laborious. If, at the end of ten days after a severe injury to the back, the patient has slight rigors and becomes partially or wholly unconscious, we are to infer that inflammation has been set up and that suppuration has taken place. These cases are almost always fatal. We may have a paraplegia, or we may have epileptiform convulsions. The paralysis, if it occurs, is caused by hæmorrhage of some of the vessels of the cord, coming on as reaction comes on, or, in a few days or weeks, as the result of contraction of lymph or pus. There may possibly be a fracture without apparent mechanical lesion, and in these cases we shall get either antero-posterior or lateral deformity of the injured part of the spine. If the injury occurs above the fourth cervical vertebra, the pressure on the phrenic nerves will give rise to death from apnœa. In these cases the respiration is stopped either at once or in a few days.

If an injury occur to the back in the dorsal region, we find paralysis of the upper extremities and paralysis of the bowels. We may diagnose a possible fracture, even if not apparent. If, in an injury to the back in the lumbar region, we get paralysis of all the parts below the seat of injury, we may also diagnose a possible fracture, although not necessarily.

We should never, in suspected fractures of the spine, endeavor to get crepitus. A fracture here will probably kill our patient, while patients not very unfrequently recover from fracture in the dorsal region. In a suspected fracture we should put the patient on his

back and make extension and counter-extension, and union may take place. We should put our patient with any serious injury to the back on a water-bed, so as to get equable pressure, and use a catheter three or four times in the course of twenty-four hours. If there is tendency to paralysis, a pill of croton oil, strychnia, and colocynth may be used.

Injuries to the back may be complicated with fractures of the hip, where there may be fracture of the cervix within the capsule,—an extra-capsular fracture,—or fracture of the brim of the acetabulum or of the floor of the acetabulum. We may possibly get, as a complication, dislocation of the hip. There is no class of surgical injuries of more interest to the neurologist and to the general practitioner who is interested in diseases of the nervous system than those which come under the head of injuries to the spine and spinal concussion.

No injury to the spine, however slight, arising from shocks to the body generally, as in railway accidents, or from the ordinary accidents we meet with in general practice, comprising falls, blows, being thrown from a carriage, is too trivial to be overlooked, as the spinal cord may be functionally disturbed, and even organically diseased from any and all such shocks and injuries. We may have local and constitutional, immediate and remote effects from these injuries. The primary effects of a concussion of the spinal cord are due to molecular changes in the structure of the cord, while the secondary effects are of an inflammatory character, consisting of meningo-myelitis, disturbances of nutrition, with great mental and moral depression.

There is often change of character, irritability of temper, and often impairment of some of the special senses. Death may occur after chronic inflammation of the membranes and cord, lasting for three or four years, during which time our patient's health has gradually been breaking down, with slow extension of paralytic symptoms. The symptoms may be immediate or they may develop slowly after an interval of some months. In a direct injury to the spine we may find our patient with a bruise on his back, with pain on pressure, with consciousness intact, with partial paraplegia, and with more or less numbness. Febrile reaction sets in and lasts for a few days, during which time he may not be able to empty his bladder, necessitating the use of the catheter every six hours. We may find a great latitude as to the extent, degree and relative amount of paralysis of motion and of sensation in any given case. If the

direct blow is on the dorsal or lumbar vertebræ, paraplegia usually results.

Sensation is necessarily affected, spasm and rigidity of the muscles may occur, the sphincters may be involved and we shall have much pain. There may be incontinence of urine or there may be partial or complete retention. Low temperature is the rule in spinal injuries, a high temperature when we meet with it being indicative of inflammatory troubles. When we find a fatal result, it is due to hæmorrhage, laceration, extravasation, or to inflammatory softening, and our patient's recovery may be complete or incomplete. A considerable length of time may elapse between a spinal concussion or injury to the back and the development of the symptoms of the injury, which may be so slight, perhaps, as to attract little attention at the time; just as we have seen, in a previous part of this work, that brain tissue degenerations and mental diseases may be separated by long intervals of time from the too premature and intense stimulation of the brain, which causes these nerve and brain diseases. This is a very important medico-legal point. The muscular, tendinous and ligamentous structures of the spinal column may be very violently wrenched and sprained by injury or concussion, without injury to the cord itself. These cases may recover in a few weeks, or, in delicate persons, they may lay the foundation for serious organic disease. If inflammation is developed in the fibrous structures, it may extend to the meninges of the cord, and this possible danger should not be overlooked or ignored in our prognosis. Our patient may slowly develop cerebral symptoms from the extension upwards of meningeal irritation. After a spinal concussion it is not at all uncommon for our patient to undergo a gradual change, both mentally and physically, and he is never the same man again. He gradually becomes an invalid, unable to apply his mind to business, or to stand the ordinary cares and worries of life, which previous to his injury had never troubled him. There is decided mental failure, which may proceed to complete imbecility or insanity. The mental responsibility of such a person is greatly lessened, and his testamentary capacity may be also affected. When injury of the back is severe enough to produce, at the time of the injury, unconsciousness, insensibility, stupor or syncope, then the severity of the concussion is such as to produce an immediate injury of the gravest nature to the central nervous system, and *never* afterwards does such an individual have complete restoration to health. After a concussion of the

spine, many weeks or months may elapse before the more positive and distressing symptoms occur. In the interval, however, our patient suffers from poor health, his nervous power has gone and his face is anxious and careworn.

His memory is defective, his thoughts are confused, his business aptitude is lost, his temper is changed, his sleep is poor, and his special senses impaired. There is also loss of motor power and a diminution of sensation in the limbs. The patient at first complains of weariness on slight exertion, either mental or physical, followed by the modifications in sensibility, pain and rigidity of spine, cerebral disturbance, and, as I have remarked, loss of motor power. When there is myelitis, the sensibility is at first augmented, and then, as the myelitis becomes chronic, the gait is very much affected. Whether acute or chronic, myelitis is much more apt to attack the lower portions of the cord than the upper, and when it attacks the upper portion of the cord, and we get cerebral complications, we may be sure we have more or less spinal meningitis. The coexistence of meningitis and myelitis is what we generally find in our patients who have suffered from severe injuries to the spine. I think it is rare to find inflammations of the spinal membranes limited to the spinal canal, and that there is an extension of the morbid process, which gives us, as a result, an increased vascularity and inflammation of the arachnoid. In spinal meningitis we have, as the most marked symptom, severe pain along the spine and down both legs. These attacks of pain may be separated by intervals of almost complete ease and comfort. The pain is soon accompanied by stiffness of the muscles of the back and legs. Any movement of the body, neck or legs, gives rise to pain. There is absence of paralysis, some exaltation of sensibility, loss of power over the bladder and partial loss of power over the bowels. There is absence of spinal tenderness, and there is also an absence of marked spasmodic symptoms. In proportion as the higher portions of the cord are affected, there is difficulty of mastication and deglutition. Difficulty of breathing generally is present. There is a little sympathetic fever, and there may or may not be cerebral symptoms. There is no increased reflex excitability.

Myelitis is characterized by paraplegic anæsthesia ushered in by tingling in the parts, which soon become anæsthetic. The paraplegia is preceded by restlessness rather than by more marked symptoms. There is a very uncomfortable feeling of tightness

around the waist or elsewhere, as a constant symptom in myelitis. There is, as a rule, absence of pain, except when our patient is suffering from the combined meningo-myelitis, of which I shall presently speak. In simple myelitis, I do not think we have much pain in the spine or extremities. There is an absence of spasmodic symptoms. As a very early symptom there is a want of control over the bladder, which depends upon a paralysis of the accelerator urinal and compressor urethral muscles. There is a want of control over the rectum also, caused by paralysis of the sphincter ani. There is absence of tenderness on pressure in any part of the spine. There is an altered sensibility to heat and cold, by which a feeling of burning is felt when a sponge soaked in moderately warm water, or a piece of ice is applied immediately above the seat of inflammation. There is annihilation of reflex excitability. There is diminution of electro-motility and electro-sensibility in the paralyzed muscles. There may or may not be priapism. The urine is generally alkaline, but neither always or necessarily so. There is marked difficulty in breathing. The state of the circulation is asthenic. There is a tendency to bed-sores, and there is in simple myelitis absence of head symptoms. In a patient who has suffered a severe injury to his back, we very probably may have coexisting cerebral meningitis, spinal meningitis and myelitis, and the symptoms will be those of meningitis or myelitis, as the one or the other preponderates. Our patient finally, as the result of nervous shock from an injury to his back, may escape organic trouble but develop spinal anæmia and marked hysteria, lasting many months. Meningo-myelitis is a very grave disease, and one which devitalizes the whole system. If our patient recovers, he is probably a broken-down man, and we must hereafter keep him on cod-liver oil, phosphorus, arsenic and bichloride of mercury, with electricity to improve his general nutrition. A patient who has had a spinal injury, may have his vision very materially impaired. There may be a weakness of sight, an intolerance of light, double vision, amblyopia, paralysis of accommodation, and anomalies of refraction.

These optic lesions are due to extension of meningeal trouble to the cerebrum. If the brain is unaffected the impairment of sight may be due to the action of the sympathetic nerves. The filaments of the sympathetic that supply the eye take their origin from that part of the spinal cord which is contiguous to the origin of the first pair of dorsal nerves, and the portion of the cord which extends from the

fifth cervical to the sixth dorsal vertebra possesses a distinct influence on the eyes and vision. I consider it certain, therefore, that we get an affection of the optic disc and its vicinity from the various disturbances of the spine consequent upon injuries to the back. These optic lesions are principally due to a cerebral meningitis that commenced as a spinal meningitis. We have perverted, impaired, or lost sensibility of the optic nervous tract as the result of spinal concussion, with atrophy of the optic disc as the final stage. Where the brain is unaffected, the loss of sight is due therefore to the transmission of the morbid action from the cord to the vessels of the eye by the agency of the sympathetic nerve, rather than by extension of inflammation.

The medico-legal aspect of a case where there has been a severe injury to the back, causing concussion of the spine, should be stated by the physician who is applied to for information, very decidedly, but briefly. Our patient's mental and physical vigor are gone, and if the changes have been organic in the cord and brain, gone probably forever. He never can be the same man as before the injury. Death is far preferable to a life of hopeless invalidism, as many such patients must ever after lead. The prognosis in these cases is always very grave if, after a year or two has elapsed from the time of the occurrence of the accident, the symptoms of meningo-myelitis either continue to be gradually progressive, or, after an interval of quiescence, suddenly assume an increased activity. Cases of injuries to the back, without apparent mechanical lesion, may die; *first*, at an early period, by the severity of the direct injury; and *second*, at a more remote date, by the occurrence of inflammation of the cord and its membranes; and finally, after the lapse of several years, by the slow and progressive development of structural changes in the cord and its membranes. The patient, if he does not die, may have a mitigation of his symptoms—an amelioration—but a thorough cure, after severe spinal concussion, we shall never, or very rarely, witness.

Our prognosis in these cases should always be very guarded. The chances are decidedly against our patient as regards complete recovery. The general health tends progressively to break down, and if our patient gets up a chronic myelitis, the chances are that he will die in a few years. Those cases are the most favorable in which the symptoms attain their intensity *soon after the injury*, while a long interval between the receipt of the injury and the development of the spinal symptoms is unfavorable to our patient's recovery. The treat-

ment is rest, counter-irritation, nerve sedatives, and the constant current of electricity to the spine. For a constitutional treatment I prefer iodide of potassium, quinine, and bichloride of mercury, with cod-liver oil. The constant current is indicated when our patient has developed a spinal anæmia, and the phosphide of zinc and strychnia are valuable also. In inflammatory states of the cord electricity and strychnia would be contraindicated, while ice-bags and ergot would do good. We must give our patient cheerful surroundings, and build him up physically and mentally, and in exceptional instances we may see complete recovery.

In conclusion, 1. It is important, from a medico-legal point of view, to remember that from an injury to the back we may have unsuspected fractures of some of the vertebræ; and that, although there may be no head symptoms and no head injury, and no paralysis, yet the injury inflicted may be of a fatal nature, although life may be prolonged for several days until death occurs from some accidental movement.

2. We may also have injuries to the back or spine occurring that are necessarily fatal, without any direct blow on the spine, but from falls on the head. We may get an inflammatory softening and disintegration of the cord in such cases.

3. We may have many diverse kinds or varieties in the extent and degree of paralysis of motion and sensation. Of course the symptoms in any given case will be varied in character and extent, according to the location of the injury, the force with which it has been inflicted, and the amount of organic lesion that the delicate substance of the spinal cord has suffered from by the shock or jar that has been inflicted upon it.

4. We may have a severe contusion, with paraplegia and an unsuspected laceration of the intervertebral ligaments, followed by death in a few days.

5. We may have a slowly developed spinal meningitis from a direct injury to the back in railway collisions, terminating eventually in death.

6. We may have a direct injury to the back and slow development of paralytic symptoms.

7. We may have compression and concussion of the cervical spine from a blow on the head, with paraplegia and a slow recovery.

8. We may have falls from horseback, or from carriage accidents,

with concussion of the spine, immediate paralysis and complete recovery.

9. We may have a direct injury to the back, without apparent mechanical lesion, followed by a paralysis of one limb only.

10. We may have a concussion of the spine from falls on the back, followed by partial paralysis of sensation and motion of the lower limbs, without affection of the sphincters, and terminating in incomplete recovery.

11. We may have falls on the back, with partial paraplegia and recovery.

12. We may have cases of slight injury to the head or back, followed by serious, persistent, or fatal results.

13. We may have epilepsy, appearing by transmission in children, whose parents have become epileptic by an injury to the spinal cord.

14. We may have hyperæsthesia, anæsthesia, pain, and perverted sensations of all sorts and kinds in cases of spinal concussion from injuries to the back.

15. After an injury to the back we may have complete recovery, incomplete recovery, permanent disease of the spinal cord, and meningitis; or, finally, death.

16 We may have a terrible nervous shock resulting from injuries to the back, no immediate effects, a chronic meningitis of the cord and base of the brain, and an imperfect recovery.

17. We may have a violent fall, with no injury externally apparent on the back or head, in which the patient is much shaken, develops symptoms of concussion of the spine, and makes a very slow recovery.

18. These general shocks, with symptoms of spinal concussion and meningitis, are generally the result of a railway collision.

19. We may have sprains or violent wrenches of the back or spine, followed by every variety of harm to the spinal column, ligaments, the cord, or its membranes.

During the past summer I had under treatment a case of meningomyelitis, the result of a blow on the spine received, so far as we could tell, some months previous. The patient was a lady of 27 years of age, who for some years had been addicted to periodical indulgence in stimulants, which had got her tissues into the worst possible state to resist any injury. When I was first called to see her her pupils were somewhat dilated, the gait staggering, there was confusion of mind, great irritability, and not a perfect understanding of her condition and surroundings. These symptoms increased, the

bladder became affected so that the catheter had to be used thrice daily, the memory was very defective, there was restless sleep with nocturnal delirium, vision was impaired, and the patient saw sparks and flashes of light, the head was hot, and she would awake out of sleep greatly frightened. Sensation was absent in both legs and, as the case progressed, all reflex movements disappeared. There was soon complete paraplegia, with numbness of a distressing nature. There was pain on pressure and on movement over the lumbar vertebra. Alteratives, and tonics, and rest, with counter-irritation, were all unavailing. The examination of the spine by the hot sponge showed exalted sensibility and pain at the level of the inflammation. In walking, the patient, in the first stages of the disease, kept her feet apart and straddled, and she had a distressing sensation as if a cord were tied tightly around the waist, and complained of the same sensation in the limbs. She also complained of shooting pains in the limbs, and of great coldness of the feet. She lost weight rapidly, even when eating well and taking no exercise. The pulse at first was slow and never rose above 120, and the temperature remained nearly normal until it finally rose to 106°, with an irregular and intermitting pulse of 120. Upon close inquiry I could not learn that in this case there had, since the accident and the time (about four or six months) of the supervention of the serious symptoms, been any interval, however short, of complete health. The cerebral disturbance in this case, the headache, confusion of thought, loss of memory, and defective vision were referable, I think, to cerebral meningitis and arachnitis. This appeared to be the result of the inflammation of the cord and its membranes ascending so as to involve the intracranial organs.

CHAPTER XXXII.

THE PSYCHOLOGY OF CRIME.

PERHAPS there is no question which interests physicians and jurists alike more than does the question of the degree of responsibility which attaches to the class of the mentally unsound who, "laboring under the tyranny of a bad organization," are constantly or periodi-

cally impelled to commit crime. This, as we shall prove further by the admirable researches of the distinguished Professor Moriz Benedikt, of Germany, is the result of a pathological state of the brain, connected with a peculiar type of skull development (shortening of the occiput, anterior vertex steepness, "*scheitelsteilheit*," and then, in decreasing progression in the asymmetry and the flattening of the occiput). Examination of the brains of murderers after death support these facts. There is a resemblance to the brute in some of these brains, in that the cerebellum is not covered by the occipital lobes and that there is also a deficient development. The insane, as a rule, never exhibit remorse or feeling of guilt for crimes committed. This is a well-known psychological truth. It is a fact not so well known, but which is supported by the assertions of Benedikt and Holtzendorff, that great criminals also rarely are penetrated by a feeling of their guilt or exhibit remorse. If they do, it is only temporary. The psychological state of criminals who exhibit the anterior vertex steepness is the analogue of recurrent mania or of chronic mania with lucid intervals. It is also analogous to states of disease in which attacks of illness of more or less short duration alternate with more or less long, and generally for a time preponderant healthy intermissions. They relapse periodically into crime, and, they all unanimously testify, from an irresistible impulse. I have a patient belonging to an old and good family who is thus ethically degenerate, in marked contrast to all the rest of the family. His history is that, when a child, he would lie about everything with apparently no reason, would not take a healthy normal interest in the sports of boyhood, but was very lazy; did not like to study, and, when older, would not work; never drank, but was addicted to self-abuse. When older, he wandered aimlessly from place to place, generally making himself so obnoxious by his foolish conduct that he shortly wore out his welcome.

Upon coming under our care we discovered at once the peculiar criminal skull formation and observed that he was, like the insane, much affected by barometrical states, and especially by thunderstorms. He seemed to be ethically degenerate, and there was a moral imbecility in his case which was probably congenital. He repeatedly has told me that he felt afraid of himself and acknowledged that he had criminal impulses, but would not state explicitly in what direction they lay. He claimed that these impulses occurred only at times, and that they were irresistible. Such cases are incurable

when congenital, and if all of them could be sent to an asylum for the chronic insane for life much harm would be saved to the community, many crimes would not be committed, and punishment by death could, as Holtzendorff and Benedikt have shown, be practically done away with. Relapses are absolutely certain in these cases, because the brain is abnormally developed. If we could examine such a brain we should find an abnormal prominence, and also a preponderance of the fissures, which is a sign of arrested development, for, as Professor Benedikt has shown, this condition arises from the circumstance that certain convolutions remain stationary in the deep parts, and have therefore not arrived at their full development or have not developed themselves. We might also find that the cerebellum was not covered by the occipital lobes of the brain, as it normally is. Professor Benedikt found this in three brains of murderers which he examined post mortem, and in a fourth case an equivalent condition was observed by him.

In an address of Professor Benedikt's before the meeting of the Juridical Society of Vienna, December 28th, 1875, he exhibited some varieties of skull formation which play a great part in the natural history of crime, and spoke as follows concerning them: "If in the normal skull, in a straight line from before backwards, the distance is measured from the fossa behind the auditory foramen to the most posterior eminence of the occiput, it will be found to amount to two-fifths and more of the straight line drawn from before backwards, in the middle line between the forehead and the summit of the occiput (the sagittal diameter). I show you now that in other skulls this is not the case, inasmuch as the first line reaches one-third, or one-fourth, or less of the second. I call this 'brachycephalia occipitalis.' In the second place I show you that the difference in height between the highest point of the forehead and the crown of the head is but small (1½ centimetre). In many skulls the difference is considerable (as much as 7 centimetres), and this proportion I call 'anterior vertex steepness.'"

Scheitelsteilheit.—A further variety is the asymmetry of the two halves of the skull; and, lastly, please to observe the form of the posterior surface; it is in certain skulls very flat, while in others this occipital flatness is wanting.

The professional robber, Professor Benedikt thinks, is affected with ethical idiocy.

Covetousness, ethical weakness of mind, pleasure in the imaginary

or actual conviction of obtaining the desired means of existence without work, when mental or bodily power is deficient, or the dislike of taking this power any longer into account, are the factors, he says, out of which the psychological product of assassination for the love of gain is composed.

Violence of temperament, continuance of a strongly-excited dislike, overweening feeling of power and of pleasure in exercising strength over relative weakness of intellect, and want of ethical development form the psychological basis of rough manslaughter, he says, as well as of murder from revenge with slight motives. The psychology of theft he describes as excessive pleasure in revelling and disgust for work, which form the peculiar basis of the ordinary thief's nature. These are the impulses, he says, which cause the consciousness of the balance between meum and tuum to be disturbed and finally to disappear altogether. The kleptomania of hysterical persons he speaks of as worthy of observation, in whom there is an impulse to possess everything without making use of it. Benedikt says that the whole psychological I is affected in the thief, but the ethical and the motor I, and the intellectual, in a more limited sense. He speaks of the special banknote forger as belonging to that type of criminals who very generally relapse, and very truly says that the same prominent characteristic feature of motive ingenuity will protect a man from the path of crime if he has the talent of conception and the spirit of origination, or if a developed ethical talent is present in his disposition. The knowledge of the complicated nature of the psychology of crimes is, however, extraordinarily important, says Benedikt, in the question of the degree of punishment to be awarded and of the possibility of amendment. When anyone with a fierce temperament and an arrogant consciousness of strength has been mentally ill-developed, has learned only the roughest hand labor, and has not been educated in morals, he may become a useful member of society if his intellect and his cleverness are developed and the slumbering better feelings are awakened. Then is the individual, he says, further developed, and the restraints which were formerly wanting may now come into activity. When the conditions are of this nature that from the impulses leading to crime there is no dissuasion and to those restraining from it there is no persuasion, there is no chance of improvement, and legislative punishment becomes stronger and stronger for habitual criminals. There is then, Benedikt says, no advantage in setting such a criminal free, for he

will again commit crime. If we now make an inquiry on the ground of these empirical experiences and their analysis, in order to find whether, in a certain percentage of certain grades and categories of crimes, certain changes cannot be detected in the brain or the skull, we shall find that we do not need to seek, as the old doctrine of Gall attempted to do, for the foundation of crime in altogether local developmental alterations, but that excesses and defects of constitution and development must be present in the three great centres of ideas, of motion, and of sensation. Benedikt further says that we must not assume, because characteristic changes are present in criminal natures, that men so constituted must necessarily commit crime. The question here, he says, is only as to a *predisposition*, just as persons with a narrow chest have a predisposition to tuberculosis or children of insane parents have an insane diathesis. It must always depend, he says, on a number of conditions whether a nature predisposed to crime will actually become a criminal, and the clearer we are as to the psychological and anthropological marks by which the disposition may be revealed, the more surely shall we prevent crime by education and watchfulness. The numerical results of the examination of a large number of heads show that "*brachycephalia occipitalis*," while wanting in 93.5 of normal skulls, is wanting in only 23 per cent. of robber-murderers and 45 per cent. of murderers from motives. It is great in only 2 per cent. of normal skulls.

Occipital flatness is wanting in 58 per cent. of normal skulls, in only 16 per cent. of the heads of robber-murderers, and in 28 per cent. of the heads of murderers from motives. It is well marked in only 12 per cent. of normal skulls, and in 59 per cent. of the heads of robber-murderers. Asymmetry is wanting in 62 per cent. of normal heads, in only 10 per cent. of the heads of robber-murderers, and in 25 per cent. of the heads of murderers from motives. It is great in only 13 per cent. of normal heads, in 43 per cent. of the heads of thieves, and in 32 per cent. of the heads of murderers.

Vertex steepness is wanting in 85.2 per cent. of normal heads, and in only 40 per cent. of the heads of thieves. Professor Benedikt says, that wherever abnormalities occur in a high degree and in combination, there exists a relapse into an earlier stage of the development of mankind, and the examinations of brains confirm this view.

The late Dr. Ray, who was an eminent alienist, said: "Let me also say that the moral pathology to be learned in these establishments (institutions for the cure of mental diseases) will have an important

bearing on some of the prominent questions of moral and social science. If we are ever to obtain a correct theory of human conduct, to discover, in any degree, the secret springs of action, or to penetrate into the mysteries of human delinquency, it must be by the study of morbid psychology in that broad and liberal manner which is possible only amid large collections of the insane. No one who declines to receive his opinions on trust can help being embarrassed by the problems presented by many an historical name, or those revelations of character so often found on the records of our courts. We seek in vain for any light on the questions thus raised, and are obliged to rest helplessly in the conviction that there are more things in heaven and earth than are dreamt of in our philosophies. Indeed, these difficulties cannot be overcome by any theories of human conduct which suppose the mind to be in a perfectly normal condition. They point to imperfection, or deficiency, or obliquity, the result of organic influences, and they can be cleared up in no degree except by the profound study of organic conditions in connection with abnormal mental phenomena. From this kind of study we may justly expect that a light will be thrown on the field of history and biography, by which many of their pages will be read with sentiments very different from those which they now inspire. It would show us that much of what the world calls genius is the result of a morbid organic activity; that many a saint, or hero, or martyr, became such more by virtue of a peculiar temperament than of a profound sense of moral or religious obligation; that the horrible crimes which have imparted an infamous distinction to the Tiberiuses and Caligulas of history proceeded rather from cerebral disorder than a native thirst for blood."

Dr. Ray says elsewhere: "The researches of Gall and Spurzheim first led to more philosophical views respecting the constitution of the brain, for although their system has failed to obtain any considerable belief, yet their particular proposition, that size is a measure of power, will scarcely be disputed now. The next step, of little less importance, was made by their followers in explaining the apparent exceptions to the rule, by supposing a diversity of quality in the materials of which the brain is composed. At a later period, the deteriorating influences of vicious or unhealthy habits and usages were made the subject of an admirable work by Morel, while the effect of nervous disorders on the cerebral organism was investigated by Moreau de Tours with remarkable acuteness. The result of these

and other kindred inquiries was to establish beyond a reasonable doubt the principle, that the brain comes into the world with the same imperfections and deficiencies, the same irresistible tendencies to disease or perversity of action, which have long been observed in regard to other organs. Thus was opened a new realm of inquiry, of unprecedented interest to the student of pathological psychology, and of immense importance in many practical relations of life. We have as yet but a faint idea of its full significance, but it needs no great faith to believe that it is destined to modify very much our present theories of human action, and throw new light on many dark problems of human conduct. Recent investigations have added new difficulties to a subject already regarded with much diversity of opinion. If overt disease, manifested by appreciable symptoms during life and various lesions after death, can annul responsibility, the question inevitably follows, *whether that cerebral condition,—neither of health nor of disease, as those terms are usually understood,—which is produced by tendencies to disease or ancestral vices, may not impair it, in some degree, under some circumstances?** This is the question of questions presented to the psychologists of our times, and destined, undoubtedly, to raise sharper conflicts than any other in the whole range of medical jurisprudence. It is involved in obscurity, it is met by the bitter prejudices of those who lead public opinion, and extensive investigations and various knowledge are needed for its solution."

A grave moral impropriety, the result of criminal impulses, is popularly called wickedness. A grave intellectual impropriety often indicates, to even a casual observer, unequivocal insanity, and is attributed to mental defect. Both may be equally the mental manifestations of imperfection, congenital defect, or abnormal depreciation of the cerebral system. The best proof of this is, that insanity and crime may both appear either in the same generation or in different generations of the same family. This is a well-known fact. "To say," says Dr. Ray, "that a man's character and conduct are determined, in a great degree, by the original constitution of his brain and nervous system, is to utter a truth that can hardly be called new. Few, however, are disposed to make any proper account of those cerebral qualities which imply a deviation of some kind or other from the line of healthy action. It is not in accordance with the philosophy of our times to see in them an explanation of these strange and

* Italics are mine.

curious traits which are utterly inexplicable on the principles that govern the conduct of ordinary men. How, then, could they expect the popular approbation who find in them a clue to some of the mysteries of human delinquency? But the teachings of science, the stern facts of observation, cannot be disregarded. Whether we ignore them or not, sooner or later their full significance will be triumphantly acknowledged. In the popular apprehension, even downright insanity is regarded as of little practical account, unless it courts observation by the force and variety of its manifestations. Only its more demonstrative forms are supposed to be capable of affecting the legal responsibility of men. The world is reluctant to believe that a person, who, in most respects, is rational and observant of the ordinary proprieties of life, can be so completely under the influence of disease as to be irresponsible for any of his acts. If the world is reluctant to allow to this class of persons the immunities of insanity, it could hardly be expected to treat, with any degree of favor, those traits or conditions of mind which imply not disease, perhaps, but abnormal imperfection of the brain. And yet it cannot be denied that the course of thought, the sense of moral distinctions, the actual conduct, may be greatly affected by the influence of such imperfection. Are we not bound, then, by a sense of justice and the claims of science, to make some account of it in forming our estimates of character and fixing the limits of responsibility? Can we do otherwise without the greatest inconsistency? Knowing that an individual is descended from a line of progenitors abounding in every form of nervous disorders, shall we think it strange that some vestige thereof should have come to him? And knowing that the quality of the brain is necessarily affected by such disorder, shall we not seek, in this fact, for an explanation of what would be inexplicable upon any ordinary principles of human conduct?"

If there is a tendency to disease, not disease itself in any particular brain, the accumulated results of experience of many able observers all tend to show that,—1st, it may die out; 2d, that it may manifest itself in all forms of nervous diseases up to fully developed mania; or, 3d, that it may show itself in inebriety or a proclivity to crime. The offspring of insane parents may be insane, inebriates, or criminals. The moral sentiments are just as apt to be affected by cerebral defect as is the purely intellectual part of our nature. It may be mental capacity and vigor, or it may be moral capacity and vigor, which is attacked by disease in any given case. Given, a *latent ten-*

dency to disease from congenital or acquired vices of cerebral conformation or nutrition, and no psychologist or alienist can predicate with any certainty whether the fully formed, fully developed attack will fall on the purely intellectual or on the moral side of a man's nature. A great criminal or a raving maniac may be the result of the evolution of the morbid psychic force. How can we as far as possible antagonize these latent tendencies if we suspect them to exist? I would answer, by a good physical education and a sound mental discipline, to strengthen the powers of the mind and keep them in healthy channels of thought, feeling, and action. In deciding between depravity and mental infirmity, we must remember that embryonic mental disease may leap into sudden and overpowering activity with just as little warning as a stroke of paralysis may result from a family tendency to it, and that an appalling crime or an attack of furious mania may follow close on a short initiatory period of depression of spirits. There are cases of incurable chronic insanity familiar to every alienist, where there are lucid intervals simulating recovery, where there is a resumption of apparently perfectly healthy mental action. A casual observer would say the person was perfectly sane. The disease, however, from what cause we know not, is merely latent, and we have personally seen the most terrific burst of mania following, with no warning save that of one sleepless night, a mental calm so deceptive that it appeared like perfect sanity. Just so in the criminal, the impulse lies in embryo, strictly in accordance with the laws of morbid action as evinced in mental disease, and we cannot tell what will be the mode of its operation. We do know that, owing to cerebral defect, it will recur quite regularly, and it seems hardly just to release a criminal who must, from the very nature of things, commit fresh crimes, and then take his life by capital punishment when his cerebral conformation would suggest that an asylum for the criminal insane for life would be the appropriate place for him. The Townley case in England, some years ago, is an instance of an appalling crime being committed by one inheriting a tendency to insanity, where great injustice was done and humanity and science lost sight of, because the public deprecated any judicial mercy, and penal servitude for life in Australia, with the subsequent suicide of the prisoner, completed the history of the unfortunate young man.

The facts of criminal psychology, Professor Benedikt has shown us, lead us to regard the impulse of criminal natures in the light of natural laws, and to believe that a deficient organization occasions

the disposition to an abnormal moral constitution. In all four of the brains of murderers which Professor Benedikt examined, it was found that there existed a deficient anthropological development, and in all four cases sentence of death was passed on the ground of the existence of a full responsibility recognized by judges and medical men. The existence of cerebral abnormities was in each case the cause of the criminal impulse. Unhealthy psychical function means generally, if not always, either a congenital or an acquired vice of conformation or nutrition of the cerebral system, and this fact should warn judges and juries to exercise great caution.

Professor Benedikt gives the description of the brains of two murderers who committed a murder for hire:

In one, the cerebellum is not covered by the occipital lobes, and the occipital brachycephalia is present on the left side. In the right hemisphere the ascending posterior spur is merged with the ascending part of the interparietal fissure, and reaches at the median surface into the gyrus fornicatus. The second parietal lobe is divided from the first temporal lobe by a long fissure (parieto-temporal fissure) which is lost in an operculum with *plis de passage* (parieto-temporal operculum), which is bounded by the lobulus tuberis and by lobules which are probably to be regarded as processes of the first and second temporal lobes, but are pretty clearly distinguished from them. The ill-developed gyri fusiformes and lingualis rise upwards steeply from the plane of the gyrus uncinatus towards the summit of the occiput, and thereby, that the fissura calcarina may reach to the same point, is the gyrus rectus of the occiput reduced to a minimum. The vertical occipital fissure is in direct communication on the one hand with the horizontal occipital fissure, and on the other hand with the sulcus hippocampi. The horizontal occipital fissure exhibits the ape-form with its *plis de passage*. The first three temporal convolutions are arranged concentrically according to the brute type, with the concavity downwards. The gyrus uncinatus and gyrus hippocampi are very deficient in convolutions. The fissura præcentralis reaches to the middle border. (The first and second frontal fissures are divided from it by imperfect convolutions.) *Plis de passage* are found both in the horizontal occipital fissure and in the parieto-temporal operculum, in the posterior spur of the fissure of the fossa Sylvii combined with the interparietal fissure, in the anterior ascending spur of the same fissure, and also in all the furrows. On the left, the posterior ascending spur of the fissure of the fossa Sylvii rises to the median line, and the interparietal and parieto-temporal fissures are separated from it by ill-developed portions of convolutions. The vertical occipital fissure is not connected with the interparietal fissure. The second frontal convolution in crossed with the fissura præcentralis, and thereby are the first and second frontal convolutions divided into (smaller) posterior and (larger) anterior halves. The fissura præcentralis reaches as far as the inferior border, and is excessively convoluted. The first and second temporal furrows are arranged in a more normal manner. In other respects the arrangement is the same as on the right.

In the second brain, the body of the organ appeared, on the other hand, altogether oblique and shortened, and the obliquely situated cerebellum was deeply imbedded in the niche of the fourth and fifth temporal convolutions, whereby the mass of the occiput appeared to be deteriorated in a high degree behind the gyrus uncinatus. On the right, he posterior spur of the fissure of the fossa Sylvii rises high up, but without reaching

the median border. The interparietal fissure is in normal proportion with it, but stands, nevertheless, in direct communication with the fissura Rolandi. The horizontal occipital fissure shows no decided similarity to the apes. The parieto-temporal fissure is not much developed; the parieto-temporal operculum is well-marked. The first three temporal fissures, with their convexity downwards, concentrically surrounding with a rim imperfectly formed convolutions. The fissura præcentralis goes as far as the median surface, and contains an operculum in the transition between the second and third frontal convolutions. The same is found (between all the three frontal convolutions) in the most anterior part of the first frontal furrow. The second frontal convolution at the base badly developed; the fissura cruciata showing a complicated operculum. The gyri hippocampi and uncinatus strongly projecting over the frontal lobes and a little furrowed. The gyri fusiformis and lingualis rising steeply towards the top of the occiput, much diminished, and especially the first very much shortened by the first two temporal convolutions, and connected in a peculiar serpentine manner with the posterior combining part of the lobulus tuberis and the second temporal lobe at the parieto-temporal operculum. The perpendicular occipital fissure is connected with the sulcus hippocampi, and conceals numerous *plis de passage*. Especially the median part of the occipital lobe reduced to a minimum. On the left, the posterior ascending spur of the fissure of the fossa Sylvii and the interparietal fissure exhibit their normal proportion, but the latter conceals in it numerous *plis de passage*. The horizontal occipital fissure exhibits the ape-structure. The parieto-temporal fissure is not well marked, but the parieto-temporal operculum is. The vertical occipital fissure is connected with the sulcus hippocampi. The first temporal furrow shows the brute form by a posterior spur (the concavity directed downwards). The fissura Rolandi is connected anteriorly with the first and third frontal furrows, and in all the fissures there are numerous opercular structures. The third frontal convolution is submerged at the base.

In the case of the first murderer's brain examined, the space of the *plis de passage* was, in the part behind the posterior central convolution, almost predominant over the developed convolutions, so that a normal type of convolutions and furrows could scarcely be drawn. Here, also, the furrow of Rolandi communicated with the fissura præcentralis. The occipital lobes scarcely covered the cerebellum.

For other writings on this subject the student is referred to works of Leuret, Gratiolet, and Broca, in France; Owen and Huxley, and their school, in England; Huschke, Virchow, and Bischoff, in Germany, and Lombroso, in Italy.

APPENDIX A.

AN ABSTRACT OF THE LAWS

RELATING TO THE

CARE AND CUSTODY OF THE INSANE

IN THE VARIOUS STATES OF THE UNION.

BY

WILLIAM J. MANN, Esq.,
MEMBER OF THE NEW YORK BAR.

ARRANGED ALPHABETICALLY ACCORDING TO STATES.

APPENDIX A.

ALABAMA.

[See Code of Alabama (1876): secs. 1470–1503, 2753–2769, 2782–2784, 2795–2807, 2894–2895, 3756–3768, 3836, 3843, 3838.]

The State Asylum is under the management of a board of seven trustees, appointed by the governor with consent of the Senate, and one of such trustees must visit the asylum once a week.

No person admitted to the asylum without certificate from one or more respectable physicians that he is insane.

The judge of the probate court may commit any indigent insane person to the asylum after investigation, and calling one respectable physician and other credible witnesses.

Guardians are appointed for the insane by the judge of probate, who have the care of the person and property of their wards. They must give bonds for the proper discharge of their duties, and are under the supervision and control of the court.

When a person has escaped indictment, or been acquitted on the ground of insanity, the court must carefully inquire and ascertain whether such insanity continues, and if so, shall order him to be sent to the asylum.

ARKANSAS.

[See Revised Statutes, Arkansas (1874): secs. 302–326, 1227, 1228, 1828, 1988, 3488–3536, 4496–4500, 4522, 4539, 9, 4539, 1966, 2001, 2002.]

The State Asylum is managed by five trustees, appointed by the governor with the consent of the Senate.

Immediately after the appointment by the court of any guardian for a lunatic or insane person, such guardian shall take steps to have the person thus placed in his charge admitted into said asylum, and on application on behalf of a person for admission into the asylum, the superintendent and board of trustees, if they think that such person ought to be admitted, may receive him as a patient therein, if the person making the application shall execute and deliver an obligation, with sufficient security, payable to the trustees of said asylum, for the payment of such sums of money as may be agreed on between them for the maintenance and care of such lunatic while in the asylum, and for his removal thereto or therefrom when necessary.—*Rev. Stat.*, sec. 320.

Said superintendent and board of trustees shall also receive all persons who may have been acquitted of crimes and misdemeanors on the ground of insanity, or who may be imprisoned for crimes and misdemeanors, upon the certificate of the judge of the circuit court before whom such persons have been acquitted or are arraigned for trial, that such persons are insane and should be received in such asylum, where they shall remain until restored to their right mind.—*Rev. Stat.*, sec. 321.

If friends of any lunatic neglect to place him in asylum and permit him to be at large, it is the duty of the circuit court of the county, on the suggestion in writing of any citizen of the county, to direct the sheriff, by writ of lunacy, to summon twelve discreet men to make inquisition thereto on oath. If the person said to be a lunatic is adjudged by said inquest, or a majority of them, to be insane, the court shall order him to be placed in an asylum.

Guardians are appointed for the insane, who must give suitable bonds, and have the charge of the persons and estates of their wards. The circuit courts have jurisdiction to appoint and superintend and control such guardians.

CALIFORNIA.

[See Hittell's Codes and Statutes of California, with supplement to 1880, Title V., chap. i., of Political Code, secs. 2136–2222. Sections 11,763–11,766, 13,361, 14,367, 14,373, etc. Supplement, secs. 10,372, 10,794, 11,763, etc., Statutes and Amendments to Code, 1881, chap. ix., p. 7; Statutes and Amendments to Code, 1883, chap. lxi., p. 288.]

The State Asylum is under the management of a board of five directors, appointed by the governor with advice of the Senate.

Whenever it appears, by affidavit, to the satisfaction of a magistrate of the county, that any person within the county is so far disordered in his mind as to endanger health, person or property, he must issue and deliver to some peace officer for service, a warrant, directing that such person be arrested and taken before any judge of a court of record within the county for examination.—*Political Code*, sec. 2210.

The judge must issue subpœnas to two or more witnesses best acquainted with such insane person, and to two physicians to appear before him. The physicians must hear the testimony and make an examination of the alleged insane person. If they believe such person to be dangerously insane, they must make a certificate showing as nearly as possible:

1. That such person is so far disordered in his mind as to endanger health, person, or property;
2. The premonitory symptoms, apparent cause or class of insanity, the duration and condition of the disease;
3. The nativity, age, residence, occupation, and previous habits of the person;
4. The place from whence the person came, and the length of his residence in this State.

The judge, after such examination and certificate, if he believes the person insane, must make an order that he be confined in the asylum. A copy of such order shall be filed with and recorded by the county clerk of the county, and the county clerk shall keep an index book, showing the name, age sex, of each person so committed, together with the date of the order and name of asylum.—*Political Code*, secs. 2210-2217. (As amended 1881.)

Guardians may be appointed to take charge of the persons and property of the insane, subject to the customary safeguards and supervision.

Every person guilty of any harsh, cruel or unkind treatment of, or of any neglect of duty towards any idiot, lunatic, or insane person, is guilty of a misdemeanor.—*Penal Code*, sec. 13,361.

COLORADO.

[See General Statute (1877), chap. lxi.; Session Laws, 1879, pp. 87–92; Session Laws, 1881, pp. 131 and 141; Session Laws, 1883, p. 32.]

The management of the State Asylum is by a superintendent and a board of three commissioners appointed by the governor.—*Laws*, 1879, p. 87.

Whenever any reputable person files a verified complaint in the county court, alleging that any person is insane, and has personal or real property, and is incapable of taking care of the same, the judge shall thereupon summon six jurors to pass upon the case. If said jury find that such person is so insane as to be unfit to manage his estate, it is the duty of said county court to appoint a conservator thereof.

If complaint is made that any person is so insane or distracted in mind as to endanger his own person or property, or the person or property of others, the judge shall issue an order for the apprehension of such alleged lunatic, and, if he so elects, an inquest shall be held as set forth in the preceding paragraph.

If the jury find that the complaint is well founded, it is the duty of the court to commit such lunatic to the county jail or other convenient place, except that such lunatic shall be delivered into the custody of any relative or friend who shall make application therefor, and shall be shown to be a proper and suitable person.

The complaints mentioned above may be joined and one inquest may determine the matters charged in both complaints.

No inquest of lunacy shall be held without ten days' notice to the alleged lunatic and to the guardian *ad litem*, to be appointed by the court.

Laws of 1879, p. 90, Amending chap. lxi., of the General Laws Concerning Lunatics.

CONNECTICUT.

[See General Statute of Connecticut (Revision of 1875), pp. 96–99. Laws, 1877, pp. 248, 254. Laws, 1878, pp. 327, 343. Laws, 1879, chap. 71.]

The trustees of the State Hospital for the Insane may authorize the superintendent to admit patients into the hospital under special agreements when there are vacancies.

SEC. 6. Any insane person may be put in any suitable place of detention, on the presentation of a certificate, made within thirty days, signed by some reputable physician, that he has made a personal examination of such person within one week prior to the date thereof, and that such person is insane, which certificate shall be sworn to before some officer authorized to administer oaths in the State where it is given, who shall certify to the genuineness of the signature thereto, and respectability of the signer; and any such person may be removed by the person placing him in such place of detention.—*General Statute*, p. 98.

SEC. 7. On a written complaint, made to any judge of the superior court, that a person named therein is insane and unfit to go at large, such judge shall immediately appoint a committee, consisting of a physician and two other persons, one of whom shall be an attorney at law, judge, or justice of the peace, who, after such person has been notified according to the order of such judge of the superior court, shall inquire into such complaint, and report to him the facts of the case and their opinions thereon; and if, in their opinion, such person should be confined, such judge shall issue an order therefor.—*General Statute*, p. 98.

Any dangerous insane person who shall go at large, may be confined by order of a justice of the peace and the first selectman of the town, after a physician's certificate, or after complaint to, and a hearing before, any justice of the peace.

For proceedings to commit an insane pauper or indigent person, see Public Acts, 1878, p. 327.

Any judge of the superior court, on information that any person is unjustly detained or confined in any insane asylum, may appoint a commission of not less than two persons to investigate the case and report. If, in their opinion, the party is improperly or illegally confined, the judge shall order his discharge.—*Public Acts*, 1878, p. 343.

DELAWARE.

[See Revised Code, 1852, as amended, etc., 1874, chap., 49; chap. 397, Vol. 11 (eleven), Laws of Delaware; chap. 57, Vol. 14, Laws of Delaware, amended by Laws of 1881; Laws of 1875, Vol. XV., Part I., chap. 57; Laws of 1881, Vol. XVI., Part II., chap. 378.]

The court of chancery has care of insane persons above the age of twenty-one years, so far as to appoint trustees to take charge of them and manage their estates.

A writ must first issue to inquire and determine by jury whether the person is insane.

Upon application by relatives or friends of any indigent lunatic or insane person to the chancellor, with certificate of two physicians practicing in the county where such person resides, the chancellor, if satisfied of the insanity and indigency of such person, shall recommend in writing to the governor his removal to such asylum, hospital, or institution for the insane, in Pennsylvania, as the governor shall select.

The governor shall request from such asylum an annual report, with full details, as to inmates sent from Delaware, and transmit the same to the legislature.

The court may, upon motion of the attorney-general, order any person who has been charged with a crime punishable with death, and acquitted on the ground of insanity, to be committed to any lunatic asylum in the United States, and may appoint a trustee to contract for the support of such person.

DISTRICT OF COLUMBIA.

[See United States Revised Statutes, 1873–74, Part II., Title LIX., chap. iv., secs. 4838-4858.]

There shall be in the District of Columbia a Government Hospital for the Insane, and its objects shall be the most humane care and enlightened curative treatment of the insane of the army and navy of the United States, and of the District of Columbia.—*United States Revised Statutes*, sec. 4838.

The superintendent of the Government Hospital for the Insane is appointed by the Secretary of the Interior.

Nine citizens of the District of Columbia, appointed by the President, constitute a Board of Visitors for the Hospital for the Insane. Such board, subject to the approval of the Secretary of the Interior, may make any needful by-laws for the government of themselves and of the superintendent and his employés, and of the patients, not inconsistent with law; they must also visit the hospital at stated intervals.

Admission of Patients.

I. The superintendent, upon the order of the Secretary of War, of the Secretary of the Navy, and of the Secretary of the Treasury, respectively, shall receive and keep in custody, until they are cured or removed by the same authority which ordered their reception, insane persons of the following description:

First. Insane persons belonging to the army, navy, marine corps, and revenue cutter service.

Second. Civilians employed in the Quartermaster's and Subsistence Department of the army, who may be, or who hereafter may become, insane while in such employment.

Third. Men who, while in the service of the United States, in the army, navy, or marine corps, have been admitted to the hospital, and have been thereafter discharged from it on the supposition that they have recovered their reason, and have within three years after such discharge become again insane, from causes existing at the time of such discharge, and have no adequate means of support.

Fourth. Indigent insane persons, who have been in either of the said services, and been discharged therefrom on account of disability arising from such insanity.

Fifth. Indigent insane persons who have become insane within three years after their discharge from such service, from causes which arose during, and were produced by, said service.—*United States Revised Statutes*, sec. 4843.

II. The Secretary of the Interior may grant an order for the admission into the hospital of any insane person not charged with a breach of the peace, when he shall receive the certificate of any judge of the Supreme Court of the District of Columbia, or of any justice of the peace of the District, and an application in writing by a member of the Board of Visitors, requesting that such order may be issued.

It must appear by such certificate that two respectable physicians, residents of the District, appeared before said judge or justice, and deposed, in writing sworn to and subscribed by them, that they knew the person alleged to be insane, and from personal examination believed such person to be in fact insane, and a fit subject for treatment in said hospital; also, that such person was a resident of the District at the time he or she was seized with such mental disorder.

It must further appear by such certificate, that two respectable resident householders appeared before the judge or justice, and deposed that they knew the person alleged to be insane, and, from a personal examination of his or her affairs, they believed said person to be unable to support himself or family, and unable to pay board and other expenses in the hospital.

The application by a member of the Board of Visitors must be made within five days after the date of the affidavits aforesaid, and it must appear therein to be made after inspection of the affidavits and certificate.

A patient able to pay part of the expenses in said hospital may be required to do so after investigation by the Board of Visitors.

Indigent insane persons, non-residents at the time they became insane, may, upon application of the governor of the District, and certificates and application as above, be admitted into the hospital with a view to their return to their friends or place of residence. —*United States Revised Statutes*, secs. 4844–4850.

III. Whenever there are vacancies, private patients from the District may be received at a rate of board to be determined by the Visitors; to be in no case less than their actual support. In this case there must be the certificate of two physicians stating that they have personally examined the patient and believe him to be insane at the time of giving the certificate, and a fit subject for treatment in the institution, accompanied by a written request for the admission from the nearest relative, legal guardian, or friend of the patient. The request for admission must be made within five days of the date of the certificate of insanity.—*United States Revised Statutes*, secs. 4853–54.

IV. Inmates of the National Home for Disabled Volunteer Soldiers, becoming insane, will be received as patients in the Government Hospital.—See *United States Statutes*, 1881–82, Vol. 22, Part I., p. 330.

V. As to admission of insane criminals, or persons charged with crime, see *United States Revised Statutes*, secs. 4851, 4852; *United States Statutes*, 1881–82, Vol. 22, Part I., p. 330.

FLORIDA.

[See McClellan's Digest of the Laws of Florida, chap. 147, page 746.]

Whenever it is suggested, by petition or otherwise, to any judge of the circuit court of the State, that there is an insane person within the limits of such judicial circuit incapable of taking care of himself or of his property, it is the duty of said judge to issue a writ to the sheriff, and cause such alleged lunatic to be brought before him. If such person is found, upon investigation, to be insane, the judge shall pass such order or decree as is usual or necessary in such cases. If it appear that such lunatic has an estate, the decree shall bind said estate. If destitute, then the judge shall order the sheriff to transport such lunatic to the asylum for indigent lunatics of the State of Florida: *Provided, however*, that the judge, in his discretion, may direct said lunatic to be delivered to any other person for his care, custody, and maintenance. For such care, etc., the said person shall receive not exceeding $150 per annum.

The comptroller, once in every six months, must send to the State attorney of each circuit a list of the lunatics in the care of private persons, and an investigation shall be made into each case by the grand juries of the several counties. By proceedings had before the judge of the circuit court the custody of such lunatics may be changed; or they may be discharged from custody, or transferred to the State Asylum.

The estates of insane persons are managed generally by guardians, who may, upon formal application, sell the real estate of their wards, and may make contracts relating to the person and estate of their wards, if approved by the judge of the circuit court.

GEORGIA.

[See Code of the State of Georgia (1882), secs. 1852 to 1864 inclusive; sec. 4666; sec. 331; sec. 4299; secs. 4695, 1658, 2735, etc ; also, as to asylums, secs. 1341 to 1373 inclusive.]

The ordinaries of the several counties may appoint guardians for the insane.—*Code*, Sec. 1852.

Proceedings.—Upon petition and proof of ten days' notice to relatives of the alleged lunatic, the ordinary issues a commission, directed to any eighteen discreet and proper persons—one of whom shall be a physician—requiring any twelve of them, including the

physician, to examine by inspection the person for whom guardianship (or commitment to the asylum) is sought, and to hear and examine witnesses, if necessary. Upon return of such commission finding the person to be as alleged in the petition, the ordinary shall appoint a guardian for him (or commit him to the lunatic asylum). Appeal lies from this decision to the Superior Court.—*Code*, secs. 1853 *et seq.*; 64 Ga., 301; 17 Ga., 595–597; 59 Ga., 675–680; Cobb's Analysis, p. 684.

Guardians of insane persons are authorized to confine them or place them in the asylum, if such a course is necessary either for their own protection or the safety of others, and a guardian wilfully failing to take such a precaution with his ward shall be responsible for injuries inflicted on others by such ward.—*Code*, sec. 1863.

Where there is no guardian for an insane person, or the guardian fails to confine his ward, and any person shall make oath that such insane person is dangerous, or should not be left at large, the ordinary shall issue a warrant, and, after investigation, may commit such insane person to the lunatic asylum.—*Code*, sec. 1864.

Courts of ordinary have jurisdiction over all matters appertaining to the estates of lunatics.—*Code*, sec. 331.

The State asylum is under the management of five trustees, appointed by the governor, one of whom shall be a competent physician.

A pay patient, resident of this State, shall not be admitted unless accompanied by authentic evidence of lunacy according to law, or there is produced the certificate of three respectable practicing physicians, well acquainted with the condition of the patient, or one from such physicians and two respectable citizens stating the cause of the application.—*Code*, sec. 1357.

A demand for trial by jury of the question of lunacy may be made before or after admission to the asylum by the alleged lunatic or his frends, and such trial must be had.

ILLINOIS.

[See Revised Statutes of Illinois (Cothran's Annotated Edition, 1881), chap. 85, page 950; Laws of Illinois, 1881, page 151; Revised Statutes, 1880 (Hurd), pages 197, 198, 593, 580, 694, 734.]

Each asylum for the insane is managed by a board of three trustees, appointed by the governor with consent of the Senate.

When any person is supposed to be insane or distracted any near relative, or in case there be none, any respectable person residing in the county may petition the judge of the county court for proceedings to inquire into such alleged insanity or distraction. For the hearing of such application and proceedings thereon the county court shall be considered as always open.—*Rev. Stat.* (Cothran's ed.), p. 950.

Such person alleged to be insane shall be brought before the court and witnesses shall be subpœnaed.

Trial shall be had by a jury of six persons, one of whom shall be a physician, and in the presence of the alleged lunatic, who may be assisted by counsel. If the jury find that such person is insane the court shall issue an order of commitment to a State Hospital for the Insane.

Pending trial the court may order the alleged lunatic to be temporarily detained by the sheriff, jailer, or other suitable person.

No person shall be received or kept in custody in any asylum or hospital for the insane until after the verdict of a jury and by order of the court. Any superintendent or officer of an asylum receiving or detaining a person without such verdict and order is liable to imprisonment for one year or to a fine not exceeding $500; can be held civilly for damages by the person injured, and, if connected with either of the State hospitals, shall be discharged.

Upon proper proceedings the courts will appoint conservators for the insane, to take charge of their person and property and care for their children in certain cases.

INDIANA.

[See Revised Statutes of Indiana, 1881, secs. 2835–2879, 5142–5150, 2546, 1764, 1765.]

The hospital for the insane is managed by a board of trustees, two of whom must visit it together monthly.

Proceedings for Commitment.

A respectable citizen of the proper county must, upon oath and in writing, make a statement before one of the justices of the peace of said county, such statement to consist of full answers to a long series of questions provided by the statutes touching the history, condition, heredity, etc., of the person alleged to be insane. The justice with whom said statement shall have been filed, together with another justice of the peace and a respectable practicing physician other than the medical attendant of the alleged lunatic, and selected by the justice, shall immediately thereupon visit and examine said person alleged to be insane. Subpœnas shall then be issued for all witnesses supposed to be cognizant of the facts, including the regular medical attendant. Formal certificates provided for by the statute must be given by the medical attendant and also the medical examiner. The justices then make a formal finding provided by the statute, and the same is deposited with the clerk of the circuit court of the proper county. Such lunatic may then be committed to the asylum, provided, that if the proper friends of such lunatic prefer to place him in a private asylum, they shall be granted a written authorization so to do by the clerk of the circuit court.

Dangerous insane persons found at large may be committed to the asylum by any justice of the peace after proper complaint and trial by a jury of six citizens.

Guardians may be appointed for the insane after proceedings provided by statute, including trial by jury.

IOWA.

[See McClain's Annotated Statutes, 1880, sections 1383–1445, 2272–2279, etc.; Revised Code of Iowa (Miller, 1880), sections 1383–1445, 4620–4628.]

Each hospital for the insane is under the charge of five trustees, two of whom may be women.

In each county there shall be a board of three commissioners of insanity. The clerk of the circuit court shall be a member of such board and the clerk thereof. The other members shall be appointed by the judge of said court and shall be one of them a practicing physician and the other a practicing lawyer.

Applications for admission to the hospital must be made in the form of an information verified by affidavit, alleging that the person in whose behalf the application is made is believed by the informant to be insane and a proper subject for custody and treatment. Upon the filing of such information the commissioners may examine the informant under oath, and if satisfied there is reasonable cause therefor, shall at once investigate the grounds thereof.

They may issue their warrant and cause the alleged lunatic to be brought before them, and may provide for his suitable custody pending the proceedings.

They must take such testimony as may be offered for and against the application, and the parties may be represented by counsel. Personal examination of the alleged lunatic must be made by a physician, and such physician may or may not be one of their own number, and his certificate must be taken.

If the commissioners find such person insane they shall order his commitment to the hospital for the insane.

An appeal lies to the circuit court from the finding of the commissioners.

The commissioners may upon application and after proper proof provide for the restraint, protection, and care of persons alleged to be insane, whose admission to the hospital is not sought.

Any person having care of an insane person, and restraining such person, whether in the hospital or elsewhere, either with or without authority, who shall treat such person

with wanton severity, harshness, or cruelty, or shall in any way abuse such person, shall be guilty of a misdemeanor, besides being liable in an action for damages.—*McClain's Annotated Stats.*, sec. 1415.

There shall be a visiting committee of three, one of whom at least shall be a woman, appointed by the governor to visit the insane asylums of the State at their discretion, and without giving notice of their intended visits, who may, upon such visit, go through the wards unaccompanied by any officer of the institution, with power to send for persons and papers, and to examine witnesses on oath to ascertain whether any of the inmates are improperly detained in the hospital or unjustly placed there, and whether the inmates are humanely and kindly treated, with full power to correct any abuses found to exist; and any injury inflicted upon the insane shall be treated as an offence, misdemeanor, or crime, as the like offence would be regarded when inflicted upon any other citizen outside of the insane asylum. They shall have power to discharge any attendant or employé who is found to have been guilty of misdemeanor meriting such discharge; and in all these trials for misdemeanor, offence, or crime, the testimony of patients shall be taken and considered for what it is worth, and no employé at the asylum shall be allowed to sit upon any jury before whom these cases are tried. Said committee shall make an annual report to the governor.

The names of this visiting committee and their post-office address shall be kept posted in every ward in the asylum, and every inmate in the asylum shall be allowed to write once a week what he or she pleases to this committee. And any member of this committee who shall neglect to heed the calls of the patient to him for protection, when proved to have been needed, shall be deemed unfit for his office, and shall be discharged by the governor.

Every person confined in any insane asylum shall be furnished by the superintendent or party having charge of such person, at least once in each week, with suitable materials for writing, inclosing, sealing, and mailing letters, if they request the same, unless otherwise ordered by the visiting committee, which order shall continue in force until countermanded by said committee.

The superintendent or party having charge of any person under confinement shall receive, if requested to do so by the person so confined, at least one letter in each week addressed to one of the visiting committee, without opening or reading the same, and without delay to deposit it in a post-office for transmittal by mail, with a proper postage stamp affixed thereto, and to deliver to said person any letter (without opening or reading the same) written to him or her by one of the visiting committee. But all other letters written by or to the person so confined may be examined by the superintendent, and, if in his opinion the delivery of such letters would be injurious to the person so confined, he may retain the same.—*McClain's Annotated Stats.*, secs. 1435–1438.

A commission may be appointed by a judge of the district or circuit court of the county to inquire as to the sanity of any person confined in the hospital. If upon the report of such commission the judge shall find the person not insane he shall order his discharge.

All persons confined as insane are entitled to the benefit of the writ of *habeas corpus*.

Guardians are appointed for the insane with like provisions as in cases of guardians for minors.

KANSAS.

[See Compiled Laws of Kansas (by C. F. W. Dassler, 1881), secs. 435–453, 3060–3120, 3416, 4757.]

The government of the insane asylums of the State shall be vested in the board of trustees of the institutions for the education of the blind, the deaf and dumb, and the asylums for the insane.—*Compiled Laws of Kan.*, sec. 435.

The board of trustees shall designate the superintendent of one of the insane asylums, to whom all applications for the admission of insane persons shall be made, and who, under such rules as may be made by the board of trustees, shall designate to which asylum each applicant shall be admitted.—*Compiled Laws of Kan.*, sec. 436.

If information in writing is given to the probate court that any one in its county is an idiot, lunatic, or person of unsound mind, or an habitual drunkard, and incapable of managing his affairs, and praying that an inquiry thereinto be had, the court, if satisfied

that there is good cause for the exercise of its jurisdiction, shall cause the facts to be inquired into by a jury.—*Compiled Laws of Kan.*, sec. 3060.

The jury shall consist of six persons, one of whom shall be a practicing physician. The person alleged to be insane has the right to be present and assisted by counsel.

If it appear that the person is insane and a fit person to be sent to the asylum, the court shall enter an order of commitment; and if it be found by the jury that the person is of unsound mind and incapable of managing his or her affairs, the court shall appoint a guardian of the person and property of such person. Such guardian must give suitable bonds, and is under the full control of the probate court.

In cases of dangerous insanity, it is the duty of the guardian, or other person in whose care such lunatic may be, to cause him to be confined in some suitable place until proceedings can be commenced in the probate court of the county, which shall make such order for the restraint, support, and safe-keeping of such insane person as circumstances require.

KENTUCKY.

[See General Statutes of Kentucky (B. & F., 1881), chap. 73, pp. 642–652; chap. 53, pp. 534–541; Civil Code of Ky., secs. 489–498.]

Each lunatic asylum of the State is under the management of a board of nine commissioners, who shall be "discreet business men," appointed by the governor with the consent of the Senate.

They are required to hold regular meetings at the asylum once a month, and one of them shall visit the asylum once a week, two in each month, a majority in each quarter, and the whole board once in six months.

No private patient, who has not been found to be insane by regular inquest, shall be received into either of said asylums.—*Gen. Stats.*, p. 649.

In order to relieve the State from an undue accumulation of patients, the several asylums may send to their respective counties or places whence they came patients who, in the judgment of the commissioners and superintendent, are harmless and governable.

The several courts of the State having general equity jurisdiction, have power and jurisdiction within their respective counties over the care and custody of the persons and estates of idiots and lunatics.—*Gen. Stats.*, p. 534.

If any person be of unsound mind, it shall be the duty of some court of the county in which he resides, having general equity jurisdiction, upon the application of the attorney of the Commonwealth, or, if he be absent, of the county attorney, to cause an inquest by a jury to be held in open court to inquire into the fact.—*Gen. Stats.*, p. 537.

The court appoints counsel for the alleged lunatic, and it is the special duty of the attorney for the Commonwealth, or for the county, to prevent the finding of any person as an idiot or lunatic who, in his opinion, is not such.

If upon such inquest any person is found to be of unsound mind, and incompetent to manage his or her estate, the court will appoint a committee for such lunatic and may order his commitment to an asylum.

The power and duty of the committee of a lunatic or imbecile is the same as that of the guardian of an infant, except as to education. But the court may appoint a person other than the committee to take charge of the person of the idiot or lunatic when not confined in an asylum, and make the necessary orders for his support upon the committee.

The officer who presides at the inquest shall endeavor to ascertain and draw up a brief history of the patient's case, embracing points provided by the statute, and such statement, or a copy, shall be sent with the record to the asylum, if the lunatic is sent.

No person not otherwise insane shall be sent to an asylum merely because he is subject to epileptic fits, or thereby rendered helpless.—*Gen. Stats.*, p. 541.

LOUISIANA.

[See Voorhies's Revised Statutes of Louisiana, 1876, secs. 1760–1780.]

The State asylum is under the management of a board of five administrators, appointed by the governor with the advice and consent of the Senate.

At every regular meeting the board shall appoint two of its members, who shall visit

said asylum at least once a week. The board shall furnish a report to the legislature at each session.

Upon petition and oath of any individual, and after "proper inquiry into all the facts and circumstances of the case," the district or parish judge may cause any lunatic to be committed to the insane asylum.

The board of administrators have authority to receive insane persons, not sent to the asylum by a district or parish judge, on such terms and conditions as they may deem fit to adopt.

Prisoners acquitted on the ground of insanity may be sent to the asylum until restored.

A curator or guardian may be appointed for an insane person, who shall have the care of the person and property of such interdicted person or ward.—*Voorhies's Revised Statutes*, secs. 1095 to 1113 inclusive; and *Revised Civil Code of Louisiana*, Title IX., p. 50.

MAINE.

[See Revised Statutes of Maine (1871), chap. 143, pp. 927–933; also pp. 58, 533, 534, 540, 537, 643, 694, 632, 770, 651, 652, 749, 898, 899, 923; Laws of 1872, chap. 54; Laws of 1873, chap. 151; Laws of 1874, chap. 256; Laws of 1876, chap. 117; Laws of 1877, chap. 188; Laws of 1879, chap. 160; Laws of 1880, chap. 184.]

The government of the Maine Insane Hospital is vested in a committee of six trustees, one of whom shall be a woman, appointed by the governor, with the advice of the council, and commissioned to hold their office during the pleasure of the governor and council, but not more than three years under any one appointment.—*Laws of* 1880, chap. 184.

In all cases of preliminary proceedings for the commitment of any person to the hospital, the evidence and certificate of at least two respectable physicians, based upon due inquiry and personal examination of the person to whom the insanity is imputed, shall be required to establish the fact of insanity, and a certified copy of the physician's certificate shall accompany the person to be committed.—*Laws of* 1876, chap. 117.

A committee of the council, consisting of two, with whom shall be associated one woman, shall be appointed by the governor annually, who shall visit the hospital at their discretion to ascertain if the inmates thereof are humanely treated, and they shall make prompt report from time to time of every instance of intentional abuse or ill-treatment to the trustees and superintendent of the hospital, who shall take notice thereof, and cause the offender to be punished as required by section twenty-eight, chapter one hundred and forty-three of the Revised Statutes.—*Laws of* 1874, chap. 256, sec. 4.

If any wilful injury shall be inflicted by any officer, attendant, or employé of the hospital, upon the person of any patient therein, and knowledge thereof shall come to the said committee of visitors, they shall report the fact immediately to the said trustees and superintendent; and if the superintendent fails forthwith to complain thereof, as required by the statute aforesaid, one of the said visitors shall enter a complaint thereof before the court having jurisdiction of such offence, and, on conviction, the offender shall be punished as provided by law. And in all trials for such offences, the statement of any patient cognizant thereof shall be taken and considered for what it may be worth, and no one connected with the hospital shall be allowed to sit upon the jury which shall try the case. —*Laws of* 1874, chap, 256, sec. 5.

In case of the sudden death of any patient in the hospital, under circumstances of reasonable suspicion as to the innocent cause thereof, a coroner's inquest shall be held, as provided by law in other cases, and the committee of visitors shall cause a coroner to be immediately notified for that purpose.—*Laws of* 1874, chap. 256, sec. 6.

If the committee are satisfied that any inmate has been improperly committed, or is unnecessarily detained, they shall make application to the proper judge for a writ of *habeas corpus*, who, after a full hearing, shall order the discharge of such inmate, if convinced that he is not a proper subject for custody.—*Laws of* 1874, chap. 256, sec. 8.

The names of the committee of visitors shall be posted in the wards, and easily accessible locked letter-boxes provided, and the inmates shall be provided with writing materials and allowed to write what and when they may please to any member of such visiting committee. No officer or attendant of the hospital shall be allowed the means of reaching the contents of such boxes.

Letters shall be delivered to patients without being opened, if forwarded by the com-

mittee, or directed to such inmate as the committee have authorized to receive or send letters without their inspection.—*Laws of* 1874, chap. 256, secs. 9–10.

Hospital to be visited at least once a month, at irregular intervals and without notice, but as far as possible unexpectedly, by a member of committee, who shall not be accompanied by any officer or employé of the hospital when making his visits, except upon his special request.

The committee of visitors shall report annually, and as much oftener as necessary, to the governor and council.—*Laws of* 1874, chap. 256, secs. 11–12.

The judge of probate may appoint a guardian for any insane person, and such guardian has the care of the person and estate of his ward, subject to the control of the court.—*Rev. Stats.*, chap. 67.

As to commitment to asylum of person indicted and acquitted on ground of insanity, or against whom the grand jury omits to find for same cause, see Laws of 1879, chap. 160.

Proceedings for transferring insane inmates of State prison or county jail to asylum, see Laws of 1877, chap. 189.

MARYLAND.

[As to the Maryland Hospital for the Insane, see Revised Code of Maryland, 1878, Article 26, p. 242; Laws of Maryland, 1880, chap. 314. Generally as to care and maintenance of the insane, see Revised Code of Maryland, 1878, Article 53, and Maryland Code Public General Laws, 1860, Article, 16, secs. 79–87. As to insane or lunatic convicts, Revised Code (1878), Article 6, p. 62.]

A court of equity may, on the application of any trustee of a person *non compos mentis*, and receiving proof that it is necessary and proper to confine such person, direct such trustee to send the person under his charge to any hospital in the vicinity of the city of Baltimore, provided he can be there received, to remain until the further order of the court.—*Rev. Code*, Art. 53, sec. 1.

When any person is alleged to be a lunatic or insane pauper, trial by a jury shall be had before such person is committed to an asylum.—*Rev. Code*, Art. 53.

Prisoner acquitted on ground of insanity shall be confined in some suitable place until he shall have recovered his reason, and be discharged by due course of law.—*Rev. Code*, Art. 53.

The courts have full power to superintend and direct the care of the insane, both as to their person and the management of their property, and appoint a committee or a trustee or trustees for such persons.

MASSACHUSETTS.

Following are public statutes of the Commonwealth of Massachusetts, enacted November 19, 1881, to take effect February 1, 1882.

General Duties of State Board.

Chapter 87, Section 1. The State board of health, lunacy and charity shall act as commissioners of lunacy, with power to investigate the question of the insanity and condition of any person committed to any lunatic hospital or asylum, public or private, or restrained of his liberty by reason of alleged insanity, at any place within this Commonwealth; and shall discharge any person so committed or restrained, if in its opinion such person is not insane, or can be cared for after such discharge without danger to others and with benefit to himself.

State Lunatic Hospitals.

Sec. 4. The government of each of the State lunatic hospitals, at Worcester, Taunton, Northampton, and Danvers, shall be vested in a board of five trustees, appointed and commissioned by the governor with the advice and consent of the council, subject to removal only for sufficient cause.

COMMITMENTS TO HOSPITALS.

SEC. 11. A judge of the supreme judicial court or superior court, in any county where he may be, and a judge of the probate court, or of a police district or municipal court within his county, may commit to either of the State lunatic hospitals, any insane person, then residing or being in said county, who, in his opinion, is a proper subject for its treatment or custody.

SEC. 12. Except when otherwise specially provided, no person shall be committed to a lunatic hospital, asylum, or other receptacle for the insane, public or private, without an order or certificate therefor, signed by one of the judges named in the preceding section, said person residing or being within the county as therein provided. Such order or certificate shall state that the judge finds that the person committed is insane, and is a fit person for treatment in an insane asylum. And said judge shall see and examine the person alleged to be insane, or state in his final order the reason why it was not deemed necessary or advisable to do so. The hearing, except when a jury is summoned, shall be at such place as the judge shall appoint. In all cases the judge shall certify in what place the lunatic resided at the time of his commitment; or if the confinement is ordered by a court, the judge shall certifiy in what place the lunatic resided at the time of the arrest in pursuance of which he was held to answer before such court; and such certificate shall, for the purposes of the preceding section, be conclusive evidence of his residence.

SEC. 13. No person shall be so committed, unless in addition to the oral testimony there has been filed with the judge a certificate signed by two physicians, each of whom is a graduate of some legally organized medical college, and has practiced three years in the State, and neither of whom is connected with any hospital or other establishment for treatment of the insane. Each must have personally examined the person alleged to be insane, within five days of signing the certificate, and each shall certify that in his opinion said person is insane and a proper subject for treatment in an insane hospital, and shall specify the facts on which his opinion is founded. A copy of the certificate, attested by the judge, shall be delivered by the officer or other person making the commitment to the superintendent of the hospital or other place of commitment, and shall be filed and kept with the order.

SEC. 14. A person applying for the commitment or for the admission of a lunatic to a State lunatic hospital, under the provisions of this chapter, shall first give notice in writing to the mayor or one or more of the selectmen of the place where the lunatic resides, of his intention to make such application, and satisfactory evidence that such notice has been given shall be produced to the judge in cases of commitment.

SEC. 15. Upon every application for the commitment or admission of an insane person to a hospital or asylum for the insane, there shall be filed with the application, or within ten days after the commitment or admission, a statement in respect to such person, showing, as nearly as can be ascertained, his age, birthplace, civil condition and occupation, the supposed cause, and the duration and character of his disease, whether mild, violent, dangerous, homicidal, suicidal, paralytic or epileptic, the previous or present existence of insanity in the person or his family; his habits in regard to temperance, whether he has been in any lunatic hospital, and, if so, what one, when, and how long, and if the patient is a woman, whether she has borne children, and, if so, what time has elapsed since the birth of the youngest; the names and address of his father, mother, children, brothers, sisters or other next of kin, not exceeding ten in number, and over eighteen years of age, when the names and address of such relatives are known by the person or persons making such application, together with any facts showing whether he has or has not a settlement, and if he has a settlement, in what place; and if the applicant is unable to state any of the above particulars, he shall state his inability to do so. The statement, or a copy thereof, shall be transmitted to the superintendent of the hospital or asylum, to be filed with the order of commitment or the application for admission. The superintendent shall, within two days from the time of the admission or commitment of an insane person, send, or cause to be sent, notice of said commitment in writing, by mail, postage prepaid, to each of said relatives, and to any other two persons whom the person committed shall designate.

SEC. 16. After hearing such other evidence as he may deem proper, the judge may issue a warrant for the apprehension and bringing before him of the alleged lunatic, if in his judgment the condition or conduct of such person renders it necessary or proper to do so. Such warrant may be directed to and be served by a private person named in said warrant, as well as by a qualified officer; and pending examination and hearing,

such order may be made concerning the care, custody or confinement of such alleged lunatic as the judge shall see fit.

SEC. 17. The judge may, in his discretion, issue a warrant to the sheriff or his deputy, directing him to summon a jury of six lawful men, to hear and determine whether the alleged lunatic is insane.

SEC. 19. The judge shall preside at such trial and administer to the jury an oath faithfully and impartially to try the issue, and the verdict of the jury shall be final on the complaint.

SEC. 25. When the State board has reason to believe that any insane person, not incurable, is deprived of proper remedial treatment, and is confined in an almshouse or other place, whether such insane person is a public charge or otherwise, it shall cause application to be made to a judge for the commitment of such person to a hospital in the manner herein prescribed.

SEC. 26. The superintendent or keeper of any lunatic hospital, including the McLean Asylum at Somerville, may receive into his custody and detain in such hospital or asylum for a period not exceeding five days without an order of a judge as provided in section eleven, any person as insane, whose case is duly certified to be one of violent and dangerous insanity and emergency by two physicians, qualified as provided in section thirteen, which certificates shall be separately made and signed, and shall conform in all other respects to the provisions of section thirteen. In addition to such certificates, an application signed by one of the selectment of the town, or by the mayor or one of the aldermen of the city in which such insane person resides or is found, shall be left with the superintendent of the hospital or asylum in which the insane person is received, and such application shall contain the statement in respect to such insane person which is required by section fifteen, and a further statement that the case is one of violent and dangerous insanity.

SEC. 27. When an insane person is committed to a lunatic hospital or asylum in accordance with the provisions of the preceding section, the party committing such person shall give a bond in the sum of one hundred dollars to the treasurer of such hospital or asylum, with condition that he will, within five days, procure an order for the commitment of said patient as provided in section eleven, or failing thereof will remove him.

SEC. 28. The superintendent or keeper of any hospital as aforesaid, may receive and detain therein, as a boarder and patient, any person who is desirous of submitting himself to treatment, and makes written application therefor, but whose mental condition is not such as to render it legal to grant a certificate of insanity in his case. No such boarder shall be detained for more than three days after having given notice in writing of his intention or desire to leave such hospital.

SEC. 29. When a patient is received into any such hospital upon his own application or under the provisions of section twenty-six, the superintendent thereof shall give immediate notice of such reception to the State board of health, lunacy and charity, stating all the particulars of the case, including the legal settlement of the person so received, if known; and said board shall immediately cause such cases to be investigated and a record to be made of all the facts pertaining thereto.

SEC. 30. Any physician who wilfully conspires with any person, unlawfully or improperly, to commit to any lunatic hospital or asylum in this State, any person who is not insane, shall be punished by fine or imprisonment at the discretion of the court.

CERTAIN PRIVILEGES OF PATIENTS IN HOSPITALS.

SEC. 35. An attorney-at-law regularly retained by or on behalf of any person committed to a lunatic hospital, asylum or receptacle for the insane, shall be admitted to visit such client at all reasonable times, if, in the opinion of the superintending officer of such hospital, asylum or receptacle, such visit would not be injurious to such person, or if a judge of the supreme judicial court, superior court or probate court in any county first orders in writing that such visits be allowed.

SEC. 36. All patients in any lunatic hospital, asylum or receptacle for the insane shall be allowed to write monthly to the superintendent and to the State board; and they shall be furnished by the superintendent with all materials necessary for such correspondence. A locked box shall be placed in each ward, in which each writer may deposit his letters, and the boxes shall be opened and the letters distributed monthly by the State board.

Transfer and Discharge of Lunatics.

Sec. 40. Any two of the trustees of a State Lunatic Asylum, on an application in writing or of their own motion, or any judge of the supreme judicial court, at any time and in any county, or the judge of the probate court for the county in which the hospital is situated, or in which the patient had his residence at the time of his commitment or admission, on such application, and after such notice as the said trustees or judge may deem reasonable and proper, may discharge any person confined therein, if it appears that such person is not insane, or, if insane will be sufficiently provided for by himself, his guardian, relatives or friends, or by the city or town liable for his support, or that his confinement therein is not longer necessary for the safety of the public or his own welfare.

Sec. 41. Any two of the trustees may also remove any person confined therein, to the city or town in which the judge committing him certified that he resided at the time of the order for commitment, or to the place of his settlement, when, in their opinion, he ceases to be dangerous, and is not susceptible of mental improvement at the hospital, if such city or town does not remove him after reasonable notice in writing.

Sec. 42. Any person may make written application to a judge of the supreme judicial court at any time and in any county, setting forth that he believes or has reason to believe that a person therein named is confined as an insane person in a lunatic hospital or other place, whether public or private, and ought not longer to be so confined, and stating the names of all persons supposed to be interested in keeping him in confinement, and requesting his discharge.

Sec. 43. The judge, upon reasonable cause being shown for a hearing, shall order notice of the time and place of hearing on said application, to be given to the superintendent in charge of the hospital or place of confinement, and to such other persons as he deems proper, and such hearing when ordered shall be had as speedily as conveniently may be, before any judge of the supreme judicial court in any county. The alleged insane person may be brought before the judge at the hearing upon a writ of *habeas corpus*, if any person so requests and the judge deems it proper, and an issue or issues may be framed and submitted to a jury by direction of the judge or on the request of any person who appears in the case. The jurors may be those in attendance on said court, if in session at the time of the hearing, or may be summoned for the special purpose on venires issued by the clerk of said court upon the order of the judge, substantially in accordance with the provisions of chapter 170.

Sec. 44. If it appears upon the verdict of the jury, or in the opinion of the judge, if not submitted to a jury, that the person so confined is not insane, or that he is not dangerous to himself or others, and ought not longer to be so confined, he shall be discharged from such confinement.

County Receptacles.

Sec. 46. There shall be in each county within the precincts of the house of correction, or if in the judgment of the county commissioners it cannot be conveniently provided within the same, then in some other building or buildings, to be deemed a part of the house of correction, a convenient apartment or receptacle for the confinement of insane persons not furiously mad.

Sec. 48. Any judge authorized under this chapter to commit lunatics may, in his discretion, commit an insane person not furiously mad, and having a settlement in this State, to the county receptacle aforesaid.

Sec. 49. Provision shall be made for the comfortable support of all persons confined in said receptacles, and they shall be governed or employed in such manner as the county commissioners may, in the exercise of their discretion, deem best. Such sum a week shall be allowed and paid for the support of the persons so confined as the commissioners shall direct, and the same may be recovered of such person, or of any parent, kindred, master, guardian, city or town bound by law to maintain him.

Sec. 50. Any insane person confined by legal authority in a jail, house of correction, or such county receptacle, may be removed therefrom to either of the State lunatic hospitals, or to any other jail, house of correction, or other suitable place, by order of the governor, when it appears to him that such removal would be expedient and just; and the sheriff of the county in which such person is confined shall execute such order and convey the insane person to the place therein designated.

Sec. 51. Any person confined by virtue of section 48 may be discharged, when, in the opinion of a judge authorized to commit insane persons, such discharge would be for the benefit of such person, or when in his opinion such person would be comfortably sup-

ported by any parent, kindred, friend, master or guardian, or by any place in which he has a legal settlement.

Private Insane Asylums.

Sec. 53. The governor and council may license any suitable person to establish and keep an asylum or private house for the reception and treatment of insane persons, and may at any time revoke such license. And such asylum or private house shall be subject to visitation by the governor and council or any committee thereof, and by the judge of the probate court of the county wherein the same is situated.

Sec. 54. Whoever establishes or keeps such an asylum or private house without a license, unless otherwise authorized by law, shall forfeit a sum not exceeding five hundred dollars.

Chap. 213, Sec. 15. When a person held in prison on a charge of having committed an indictable offence, is not indicted by the grand jury by reason of insanity, the grand jury shall certify that fact to the court, and thereupon the court, if satisfied that he is insane, may order him to be committed to a State lunatic hospital, under such limitation as may seem proper.

Sec. 30. A judge of the supreme judicial court sitting for the arraignment of a person charged with murder shall have the same power to commit such person to a lunatic hospital, if found by him to be insane, as the court would have if sitting at a regular term thereof.

Chap. 214, Sec. 16. When a person indicted is, at the time appointed for the trial, found, to the satisfaction of the court, to be insane, the court may cause him to be removed to one of the State lunatic hospitals for such a term and under such limitations as it may direct.

Sec. 19. When a person is acquitted by the jury by reason of insanity, the jury shall state that fact to the court, and thereupon the court, if satisfied that he is insane, may order him to be committed to a State lunatic hospital, under such limitations as may seem proper.

Sec. 20. When a person indicted for murder or manslaughter is acquitted by the jury by reason of insanity, the court shall order such person to be committed to one of the State lunatic hospitals during his natural life.

Sec. 21. Any person committed to a State lunatic hospital, under the preceding section, may be discharged therefrom by the governor, by and with the advice and consent of the council, when he is satisfied, after a hearing of the matter, that such person may be discharged without danger to others.

Chap. 215, Sec. 34. If a person convicted of a capital crime is, at the time when motion for sentence is made, found, to the satisfaction of the court, to be insane, the court may cause such person to be removed to one of the State lunatic hospitals for such a term and under such limitations as it may direct.

Sec. 35. If it appears to the satisfaction of the governor and council that a convict under sentence of death has become insane, the execution of said sentence may be respited by the governor, by and with the advice of the council, from time to time for stated periods, until it appears to their satisfaction that the convict is no longer insane.

Removal of Insane Prisoners.

Chap. 222, Sec. 10. The State board of health, lunacy and charity shall designate two persons, expert in cases of insanity, to examine convicts in the State prison or reformatory prison alleged to be insane. When any such convict appears to be insane, the warden or superintendent shall notify one of the persons so designated, who shall, with the physician of the prison, examine the convict, and report to the governor the result of their investigation. If upon such report the governor deems the convict insane and his removal expedient, he shall issue his warrant directed to the warden or superintendent, authorizing him to cause the convict to be removed to one of the State lunatic hospitals, there to be kept until, in the judgment of the superintendent and trustees of the hospital to which he may be committed, he should be returned to prison. When the superintendent and trustees of the hospital have come to such judgment, the fact shall be certified upon the warrant of the governor, and notice shall be given to the warden or superintendent of the prison, who shall thereupon cause the convict to be reconveyed to the prison, there to remain pursuant to the original sentence, computing the time of his detention or confinement in the hospital as part of the term of his imprisonment.

Sec. 12. When a convict in a house of correction or prison other than the State prison or reformatory prison appears to be insane, the physician in attendance shall make a re-

port thereof to the jailer or master, who shall transmit the same to one of the judges mentioned in section 11, chapter 87. The judge shall make inquiry into the facts, and, if satisfied that the convict is insane, shall order his removal to one of the State lunatic hospitals pursuant to the provisions of sections twelve and thirteen of said chapter.

SEC. 13. If any person so removed becomes sane before the expiration of his sentence, he shall be forthwith returned to the prison or house of correction from which he was removed, there to remain, pursuant to his original sentence, computing the time of his confinement in the hospital as part of the term of his imprisonment.

SEC. 14. When a person held in any jail for trial or for sentence, except for a capital crime, appears to be insane, he may be removed to one of the State lunatic hospitals as a convict may be removed from the house of correction under section twelve. When a person so removed is, in the opinion of the trustees and superintendent of the hospital, restored to sanity, he shall be forthwith returned to the jail from which he was removed, where he shall be held in accordance with the terms of the process by which he was originally committed thereto.

MICHIGAN.

[See Public Acts, 1877, pp. 215–226, 120, 168, 203, 204. Public Acts, 1881, pp. 267–269, 247, 139, 231. Compiled Laws, 1872, secs. 4822, *et seq.* Howell's annotated statutes (1882) pp. 513–529.]

Each State asylum is under the control of a separate board of six trustees, appointed by the governor with the consent of the Senate.

They have power to establish by-laws regulating the conditions of admission and discharge of patients.

They are required to maintain an "effective inspection" of the asylum, and to visit it at stated times.

When a person in indigent circumstances, and not a pauper, becomes insane, application may be made in his behalf to the judge of probate of the county where he resides; and said judge of probate shall immediately notify such alleged insane person of such application, and of the time and place of hearing to be held thereon; he shall also call two respectable physicians, and other credible witnesses, and also immediately notify the prosecuting attorney of the county, and the supervisor of the township or ward in which such insane person resides, of the time and place of such hearing, whose duty it shall be to attend the examination and act in behalf of said county; and said judge of probate shall fully investigate the facts in the case, and either with, or without, the verdict of a jury, at his discretion, as to the question of insanity, shall decide the case as to his indigence, but the decision of indigence shall not be conclusive in such county; and if the judge of probate certifies that satisfactory proof has been adduced, showing him insane, and his estate insufficient to support him and his family, or, if he has no family, himself, under the visitation of insanity, on his certificate under the seal of the probate court of said county, he shall be admitted into the asylum, and supported there at the expense of the county to which he belongs, until he shall be restored to soundness of mind, if effected in two years, and until otherwise ordered. The judge of probate in such case shall have power to compel the attendance of witnesses and jurors, and shall file the certificates of the physicians, taken under oath, and other papers, in his office, and enter the proper order in the journal of the probate court in his office.

The judge of probate shall report the result of his proceedings to the supervisors of his county, if such person belongs to that county, whose duty it shall be, at the next annual meeting thereafter, to raise money requisite to meet the expenses of support accordingly.—*Public Acts*, 1881, No. 147, amending section 26, of Act No. 194 of session 1877.

When an insane person in indigent circumstances shall have been sent to the asylum by his friends, who have paid his bills therein for three months, if the superintendent shall certify he is a fit patient, the supervisors of the county of his residence are authorized and required, upon an application under oath in his behalf, to defray the expenses of his remaining there until otherwise ordered.—*Public Acts*, 1877, No. 194, sec. 29.

The relatives or friends of any insane person may apply to the judge of probate to have a guardian appointed for him. The judge shall cause fourteen days' notice of the hearing to be given to such alleged insane person. If, after full hearing, it appears to the

judge that such person is insane and incapable of taking care of himself and managing his property, he shall appoint a guardian, who shall have the care and custody of the person of his ward, and the management of his estate.—*Compiled Laws*, secs. 4822 *et seq.*, and *Public Acts*, 1877, No. 130.

MINNESOTA.

[See Statutes of Minnesota (1878), pp. 454–459, 598, 958.]

The State Asylum is under the control of a board of seven trustees, appointed by the governor, with the advice and consent of the Senate.

The probate judge, or, in his absence, the court commissioner of any county, upon information being filed before him that there is an insane person in his county needing care and treatment, shall cause the person so alleged to be insane to be examined by a jury consisting of two respectable persons besides himself, one at least of whom shall be a physician, to ascertain the fact of his insanity; and if the said person is found to be insane, he shall, upon the written certificate of the judge, directed by a majority of the jury, issue duplicate warrants, committing the person so found insane to the care of the superintendent of the hospital, and shall place the warrant in the hands of the sheriff, or some other suitable person, whom he shall authorize to convey the said insane person to the hospital.—*General Statutes of Minnesota*, 1878, p. 455.

The relatives of any person charged with insanity, or who shall be found to be insane under section seventeen of this act, shall, in all cases, have the right to take charge of and keep said insane person or persons, if they shall desire so to do, but the probate judge or court commissioner may require a bond of such relatives, conditioned for the proper and safe keeping of such person or persons; and if the relatives or friends of any patient kept in the hospital, shall ask for the discharge of such patient, the superintendent may, in his discretion, require a bond to be executed to the State of Minnesota, in such sum and with such sureties as he may deem proper, conditioned for the safe keeping of such patient: *Provided*, that no patient that may be under the charge of, or convicted of homicide, shall be discharged without the consent of the superintendent and board of trustees.—*General Statutes of Minnesota*, 1878, p. 456.

The governor shall appoint two members of the State board, who shall serve for the term of one year, and who, together with the superintendent of the hospital for the insane, constitute a commission, whose duty it is to visit the asylum at least once in every six months, to ascertain whether any persons are in the asylum who ought not to be there, and are not insane, and, if they find any such to order their discharge.

The superintendent of the Minnesota Hospital for the Insane is hereby required, on the first day of each month, to make out a report in writing, showing the condition of each patient in said hospital (separately), with reference to bodily health; appetite; sleep; mental symptoms, generally; particular symptoms; mental state; habits and inclinations; prospect of restoration; and shall forward by mail to the next of kin of each of such patients, respectively, a copy of such report, without charge, within the first week of each month.—*General Statutes*, 1881, p. 458; *Laws*, 1872, chap. 17, § 1.

In cases of partition and division of estates, guardians are appointed for insane persons.

MISSISSIPPI.

[See Revised Code of Mississippi, 1880, chap. 13, secs. 642–668, inclusive; Laws of 1882, pp. 61, 62, 63, 64; also, as to guardians for the insane, see Code, secs. 2118–2122, inclusive.]

The State Asylum is under the management of a board of five trustees, appointed by the governor. The governor is, *ex officio*, president of the board. The trustees are required to keep a bound record of all their doings, and one or more of them to visit the asylum at least once a month.

The governor has the appointment and removal of the medical superintendent.

The superintendent and board of trustees may, upon application, receive a patient

who they think ought to be admitted, even though no proceedings in lunacy have been instituted.

It is the duty of the clerk of the chancery court of any county where a lunatic is allowed to be at large to direct the sheriff by writ of lunacy to summon the alleged lunatic, and six discreet persons to make inquisition thereto.

If such inquest, or a majority of them, adjudge that such person is a lunatic, he shall be committed to the asylum.

The chancery courts of the State may order an inquisition and appoint a guardian for any insane person. Such guardian has the care of the person and estate of the lunatic, and must give bonds, and is accountable to and under the control of the courts.

MISSOURI.

[See Revised Statutes of Missouri (1879), secs., 4102–4159, 5787–5837. Laws of 1881, pp. 123, 141. Laws of 1883, pp. 78, 79.]

The State lunatic asylum is under the control and direction of a board of nine managers, three of whom shall be competent physicians, appointed by the governor, with the advice and consent of the Senate.

Two of the managers shall, together, visit the asylum monthly; a majority of them, together, quarterly; and all the managers, together, shall make a visit once a year.

Pay patients, or those not sent to the asylum by order of the court, may be admitted on such terms as shall be, by this chapter and the by-laws of the asylum, prescribed and regulated.—*Revised Statutes*, sec. 4119.

Preparatory to the admission of such a patient, the superintendent shall be furnished with a request, of the form seen in section four thousand one hundred and twenty-one, under the hand of the person by whose direction he is sent, stating his age and place of nativity, if known, his christian and surname, place of residence, occupation, and degree of relationship or other circumstances of connection between him and the person requesting his admission; and, second, a certificate of the form seen in section four thousand one hundred and twenty-two, dated within two months, under oath, signed by two physicians, of the fact of his being insane.

Each person, signing such request or certificate, shall annex to his name his profession or occupation, and the township, county, and State of his residence, unless these appear on the face of the document. Before any private patient shall be received into the asylum, there shall be produced to the superintendent a receipt from the treasurer of the asylum, acknowledging the payment to him of at least thirty days' charges in advance, and a sufficient bond to said treasurer, conditioned that the obligor or obligors will secure the payment of charges incurred in behalf of and on account of said patient; said bond, with satisfactory securities, shall be of the form and contain the provisions as provided in section four thousand one hundred and twenty-three.

No part of said thirty days' payment shall be refunded if the patient making such payment shall be taken away within that period, uncured, and against the consent of the superintendent.—*Revised Statutes*, sec. 4120.

Form of Request for Admission.

To the Superintendent of the Missouri State Lunatic Asylum:

The undersigned, of the county of ———, is desirous of placing in the State Lunatic Asylum, at Fulton, and hereby requests the admission therein, of —— ——, a resident of the county of ———, who is aged —, and has been [here state what the occupation of the person has been]. He [or she] is a native of ———, in the State of ———, and is [here state what the relationship or circumstances of connection may be] of the undersigned; [then should follow a written history of the case, including the alleged cause of insanity, when it commenced, and all the particulars thereof.]

Dated, —— day of ——, 18—.

Form of Physician's Certificate.

STATE OF ———— } ss.
COUNTY OF ——. }

We, —— ——, and —— ——, of the County and State aforesaid, physicians, do hereby certify that we have this day seen and examined [here insert the name of the

patient], of the county of ———, and believe — to be insane, and a proper patient to be sent to the State lunatic asylum.

(Signed) ——— ———,
——— ———.

The above named, ———, and ———, being duly sworn, say that they are practicing physicians, of the county aforesaid, and that the facts stated in the above certificate, by them subscribed, are true, according to the best of their knowledge and belief.

(Signed) ——— ———,
——— ———.

Sworn to and subscribed before me, this —— day of ———, 18—.

——— ———, J. P.

Patients may be sent by the county court to said asylum, upon application or statement filed with the clerk of the county court, stating insanity, indigence, etc., and after proper investigation before the court, or court and jury, and examination of witnesses, including at least one physician.

After trial by jury in the probate court, a guardian may be appointed of the person and estate of the person so found to be insane.—See *Revised Statutes*, secs. 5787, 5837.

NEBRASKA.

[See Compiled Statutes of Nebraska (Guy A. Brown, 1881), chap. 40, pp. 300–308, and p. 292; Appendix to same, chap. 40, p. 867; Laws of Neb., 1883, chaps. 48 and 49, pp. 234 and 235.]

The State hospital, located at Lincoln, is under the charge of three trustees, but the governor of the State appoints the superintendent, and may appoint two assistant physicians, one of whom shall be a woman.—See *Compiled Stats.*, p. 300, and *App.*, p. 897.

In each county there shall be a board of three commissioners, composed of the clerk of the district court, a physician, and a lawyer. Said commissioners regulate admissions to the asylum and the general safe-keeping of insane persons within their county.

Upon the filing of an information with affidavit, alleging the insanity of the person in whose behalf the application is made, the commissioners will make an investigation. They have power to subpœna witnesses, administer oaths, and do any act of a court necessary in the premises. A physician (who may be one of their own number) must be appointed to examine the patient and make a certificate. The person alleged to be insane may appear and resist the application, and the parties may be represented by counsel.

If the commissioners find that the person alleged to be insane is insane, and a fit subject for treatment, they may issue a warrant and cause his removal to the asylum. No female person shall be thus taken to the hospital without the attendance of some other female, or some relative of such person, and the friends or relatives of any person so found insane have the privilege of executing the warrant of removal to the asylum instead of the sheriff, if they so request —See *Compiled Stats.*, pp. 302–303.

In each case of application for admission to hospital, correct answers, so far as possible, to a series of questions provided by the statute must accompany the physician's certificate.

No person supposed to be insane shall be restrained of his or her liberty by any other person, otherwise than in pursuance of authority obtained as herein required, excepting to such extent and for such brief period as may be necessary for the safety of persons and property, until such authority can be obtained.

Any person having care of an insane person and restraining such person, either with or without authority, who shall treat such person with wanton severity, or harshness, or cruelty, or shall in any way abuse such person, shall be guilty of a misdemeanor, besides being liable in an action for damages.—*Compiled Stats.*, p. 305.

Privileges of Inmates.

That henceforth there shall be no censorship exercised over the correspondence of inmates of the hospital for the insane in this State, but their post-office rights shall be as free and unrestrained as are those of any resident or citizen of this State, and be under the

protection of the same postal laws. And every inmate shall be allowed to write when and whenever he or she desires to any person he or she may choose. And it is hereby made the duty of the superintendent to furnish each and every inmate of each and every insane asylum in this State with suitable material, at the expense of the State, for writing, inclosing, sealing, stamping, and mailing letters, sufficient for writing at least one letter a week, provided they request the same, unless they are otherwise furnished with such material; and all such letters shall be dropped by the writers thereof, accompanied by an attendant when necessary, into a post-office box, provided by the State at the hospital for the insane, and kept in some place easy of access to all the patients; and the contents of such post-office box or boxes shall be collected once every week by an authorized person, and by him placed into the hands of the United States mail for delivery. And it is hereby made the duty of the superintendent of every hospital for the insane in this State, either public or private, to deliver, or cause to be delivered, to said person any letter or writing to him or her directed, without opening or reading the same, or allowing it to be opened or read, without the consent of the recipient of such letter, or the request or the consent of the writer.

[Section one of "An act for the protection of the inmates of the hospital for the insane," took effect February 27, 1883.]—See *Appendix to Compiled Stats.*, p. 867; and *Gen. Laws*, 1882–3, chap. 40, p. 300.

Penalty.

That any person refusing or neglecting to comply with, or wilfully and knowingly violating, any of the provisions of this act, shall, upon conviction thereof, be punished by imprisonment in the penitentiary for a time not exceeding three years nor less than six months, or by a fine not exceeding five hundred dollars, or both, at the discretion of the court, and by ineligibility to any office in the asylum afterward.—*Id.*, § 2.

Act to be Posted.

A printed copy of this act shall be framed and kept posted in every ward of every hospital for the insane, both public and private, in the State of Nebraska.—*Id.*, § 3.

Upon proper proceedings, guardians may be appointed for the insane by the probate court.—See *Compiled Stats.*, p. 292.

NEVADA.

[See Compiled Laws of Nevada (1873), secs. 3740–3745, and sec. 845; Statutes of Nevada, 1881, chap. 42, p. 59; Stats. of Nev., 1883, chap. 76, p. 102.]

A board of commissioners, consisting of the governor, lieutenant-governor, State controller, State treasurer, and two others, has, by statute, the full power and exclusive control over the State asylum.

Upon the application of any person under oath to the judge of the district court, setting forth that any person is insane, said judge shall cause such person to be brought before him, and shall also summon one or more licensed practicing physicians, who shall proceed to examine the person alleged to be insane. If said physicians shall, after a careful examination, certify upon oath that the charge is correct, and the judge is satisfied that it is unsafe for such person to be at large, he shall cause such insane person to be committed to the asylum. If such person is indigent and without relatives in the State, his support at the asylum shall be at the expense of the State. Paying patients shall pay according to the terms directed by the board of commissioners; but the statute provides that the insane poor shall, in all respects, receive the same medical care and treatment and good, wholesome food.—*Laws of* 1881, chap. 42.

Upon application and proper proceedings before the probate judge, a guardian may be appointed of the person and estate of any person who shall appear to be insane and incapable of taking care of himself and managing his property.—*Compiled Laws*, p, 206, secs. 845 *et seq.*

NEW HAMPSHIRE.

[General Laws of New Hampshire (1878), chap. 10.]

The Asylum for the Insane.

Section 1. The asylum for the insane at Concord is a corporation under the name of the New Hampshire Asylum for the Insane.

Sec. 2. The government of the asylum is vested in twelve trustees, appointed and commissioned by the governor, with advice of the council; and all vacancies shall be filled in the same manner.

Sec. 7. The trustees may make such regulations for their own government, for the management of the asylum and all persons connected therewith, and for the admission and care of patients, and the same, from time to time, alter, as convenience may require.

Sec. 9 (abst.). The trustees shall report annually to the governor and council.

Sec. 10. The governor and council, president of the Senate and speaker of the House shall constitute a board of visitors of the asylum; shall visit and inspect the same when necessary; examine into the condition of the patients, and the regulations and general management of the asylum; see that the design thereof is carried into full effect; and make to the legislature, biennially, a report, which shall be furnished to the secretary of state on or before the 20th day of April next before the June session.

Sec. 12. If any insane person is in such condition as to render it dangerous that he should be at large, the judge of probate, upon petition by any person, and such notice to the selectmen of the town in which such insane person is, or to his guardian or any other person, as he may order,—which petition may be filed, notice issued, and a hearing had in vacation or otherwise,—may commit such insane person to the asylum.

Sec. 13. If any insane person is confined in any jail, the supreme court may order him to be committed to the asylum, if they think it expedient.

Sec. 14. Any insane pauper supported by any town may be committed to the asylum by order of the overseers of the poor, and there supported at the expense of such town; and such expense may be recovered by such town of the county, town, or person chargeable with the support of such pauper, in the same manner as if he had been supported in and by the town.

Sec. 15. If the overseers neglect to make such order in relation to any insane county pauper, the supreme court, or any two judges thereof in vacation, may order such pauper to be committed to the asylum, and there supported at the expense of the county.

Sec. 16. Any insane person committed to the asylum by order of the supreme court, such person having been charged with an offence the punishment whereof as prescribed by law is death or confinement in the State prison, shall, during his confinement in the asylum for the insane, be supported therein at the expense of the State. Any insane person committed to the asylum by any court, except as herein provided, or by any judge of probate, shall be supported by the county from which he was committed.

Sec. 17. The parent, guardian, or friends of any insane person may cause him to be committed to the asylum, with the consent of the trustees, and there supported on such terms as they may agree; but the city of Concord shall not, in any case, be liable for the support or maintenance of any person committed to said asylum, except from said city.

Sec. 18. No person shall be committed to the asylum for the insane, except by the order of the court or the judge of probate, without the certificate of two reputable physicians that such person is insane, given after a personal examination made within one week of the committal; and such certificate shall be accompanied by a certificate from a judge of the supreme court or court of probate, or mayor, or chairman of the selectmen, testifying to the genuineness of the signatures and the respectability of the signers.

Secs. 19, 20 and 21 (abst.). Person committed shall be supported by his county if without means or relatives of sufficient ability.

Sec. 22. Any person committed to the asylum may be discharged by any three of the trustees, or by any justice of the supreme court, whenever the cause of commitment ceases or a further residence at the asylum is, in their opinion, not necessary; but any person so discharged, who was under sentence of imprisonment at the time of his commitment, the period of which shall not have expired, shall be remanded to prison.

SEC. 23. Some one of the board of trustees of the asylum shall, without previous notice, visit the institution at least twice every month, and give suitable opportunity to every patient therein who may desire it to make to him, in private, any statements such patients may wish to make; and, whenever in his opinion it may be deemed proper, he shall call to his aid two other members of said board, who shall, with him, make a further examination of such patient and of the statements by him made. If, in their view, the cause of commitment no longer exists, or a further residence at the asylum is not necessary, it shall be their duty to discharge such patient. Should they deem the treatment of any patient injudicious, they shall order such an immediate change of the same as to them seems proper; and, in case of failure to secure it, they shall at once summon a meeting of the whole board, whose duty it shall be to take such measures as the exigency of the case demands.

SEC. 24. It shall be the duty of the superintendent to furnish stationery to any patient who may desire it, and to transmit any letter such patient may address to the board of trustees, to such member as said board shall have designated to receive such correspondence, and all such letters shall be promptly transmitted without inspection.

SEC. 25. In event of the sudden death of any patient in the asylum, a coroner's inquest shall be held, as provided for by law in other cases.

SEC. 27. The governor, with the advice of the council, may remove to the asylum, to be there kept at the expense of the State, any person confined in the State prison who is insane.

SEC. 28. The sum of six thousand dollars is annually appropriated for the maintenance of indigent insane persons belonging to this State at the asylum, for such and so many as the governor may from time to time approve, not less than two-thirds of which sum shall be applied annually to the support of private patients exclusive of paupers maintained at public charge; and the sum of one hundred dollars is annually appropriated toward the support and increase of the library for the insane.

Laws of 1881, Chapter 140.

JOINT RESOLUTION AUTHORIZING THE GOVERNOR TO APPOINT SUITABLE PERSONS TO EXAMINE INTO THE CONDITION OF INSANE PERSONS IN THE COUNTY ALMSHOUSES IN THIS STATE.

Resolved, by the Senate and House of Representatives, in General Assembly convened:

That the governor, with the advice of the council, shall, on or before the first day of October next, appoint three competent persons, of whom one shall be a physician, one a lawyer, and the third a man of general business experience, whose duty it shall be to visit the several county almshouses in the State, examine into the condition of every insane person there detained; and report to the governor and council, on or before the first day of May, 1883, the number, condition, the manner of care, and treatment of all such persons, together with such recommendations relative to a modification or improvement of the same as from their investigations they may deem necessary; which report, with such suggestions as he may think advisable, the governor shall cause to be printed and laid before the legislature at its next session.

The persons so appointed shall receive no compensation for their services, but shall be paid their necessary travelling expenses from the treasury of the State.

(Approved August 18, 1881.)

Laws of 1879, Chapter 92.

JOINT RESOLUTION RELATING TO THE PRICE OF BOARD IN THE ASYLUM FOR THE INSANE.

Resolved, by the Senate and House of Representatives, in General Assembly convened:

The governor and council are hereby directed to take immediate steps to cause a reduction in the board at the insane asylum to four dollars per week: *Provided*, That this resolution shall not be construed to forfeit the charge and payment for necessary attendance and expense required by any patient in case of severe sickness or accident.

(Approved July 19, 1879.)

NEW JERSEY.

No person shall be admitted into the State asylum for the insane unless by order of some court or judge authorized to send patients, without lodging with the superintendent, First, a request for admission, under the hand of the person by whose direction he is sent, stating his age, place of nativity, residence, occupation, degree of relationship, etc., and second, a certificate dated within one month, under oath, signed by one respectable physician.—*New Jersey Revision*, 1877, sec. 17, page 623.

Insane paupers may be sent to State asylum by order of court after examination and certificate of one physician called by the court, and are supported by the county of their residence.

Persons in indigent circumstances, not paupers, may, upon application to the court and after investigation and examination by one reputable physician called by the court, and either with or without the verdict of a jury, be sent to the State asylum and supported at the expense of the county.—*New Jersey Revision*, 1877, p. 624.

When a person shall have escaped indictment or have been acquitted of a criminal charge upon trial on the ground of insanity, the court shall inquire whether his insanity in any degree continues, and if it does shall order him into safe custody.—*New Jersey Revision*, 1877, p. 625.

Persons confined in jail who shall appear to be insane may, after proper investigations and proceedings, be sent by the court to the insane asylum.—*Ibid.*, p. 625.

Any two justices of the peace of the county in which any lunatic too furiously mad or dangerous to be permitted to go at large shall be found, may cause such person to be apprehended and kept safely locked up and chained if necessary in some secure place until the last legal settlement of such person can be ascertained; or if such information cannot be obtained such person may be conveyed to any place in the county provided for the reception of maniacs or lunatics, or, in the absence of such place, may be conveyed to the county jail.

This not to restrain or abridge the power or authority of the chancellor, orphans' court, or guardian touching such person, or to prevent any friends or relatives of such person from taking him under their protection.—*New Jersey Revision*, 1877, p. 605.

Board of managers to maintain effective inspection of the State asylum, and one or more of them to visit it at least once a week, two or more at least once a month, a majority at least once in three months, and the whole board once a year at the times and in the manner prescribed in the by-laws. Managers to note in a bound book their visits, with remarks, and this to be inserted in their annual report to the governor.—*New Jersey Revision*, p. 622.

NEW YORK.

[See Laws of 1874, chap. 446; Laws of 1875, chap. 574; Laws of 1876, chap. 267; Laws of 1878, chap. 47; Laws of 1880, chap. 423; New York Revised Statutes (sixth edition, Banks Bros.), vol. ii., page 841, *et seq.*; New York Code, Civil Procedure, secs. 2320–2364, and 1590; New York Penal Code, secs. 377 and 445.]

Commitment of the Insane.

Laws of 1874, Chapter 446, Article 1.

Section 1. No person shall be committed to or confined as a patient in any asylum, public or private, or in any institution, home, or retreat, for the care and treatment of the insane, except upon the certificate of two physicians, under oath, setting forth the insanity of such person. But no person shall be held in confinement in any such asylum for more than five days, unless within that time such certificate be approved by a judge or justice of a court of record of the county or district in which the alleged lunatic resides, and said judge or justice may institute inquiry and take proofs as to any alleged lunacy before approving or disapproving of such certificate, and said judge or justice may, in his discretion, call a jury in each case to determine the question of lunacy.

Sec. 2. It shall not be lawful for any physician to certify to the insanity of any person for the purpose of securing his commitment to an asylum, unless said physician be of

reputable character, a graduate of some incorporated medical college, a permanent resident of the State, and shall have been in the actual practice of his profession for at least three years, and such qualifications shall be certified to by a judge of any court of record. No certificate of insanity shall be made except after a personal examination of the party alleged to be insane, and according to forms prescribed by the State commissioner in lunacy, and every such certificate shall bear date of not more than ten days prior to such commitment.

SEC. 3. It shall not be lawful for any physician to certify to the insanity of any person for the purpose of committing him to an asylum of which the said physician is either the superintendent, proprietor, an officer or a regular professional attendant therein.

SEC. 4. Every superintendent of a State asylum or public or private asylum, institution, home, or retreat for the care and treatment of the insane, shall, within three days after the reception of any patient, make or cause to be made, a descriptive entry of such case in a book exclusively set apart for that purpose. He shall also make entries from time to time of the mental state, bodily condition, and medical treatment of such patient, together with the forms of restraint employed, during the time such patient remains under his care, and in the event of the discharge or death of such patient, the superintendent aforesaid shall state in such case-book the circumstances appertaining thereto.

SEC. 5. The county superintendents of the poor of any county or town, to which any person shall be chargeable, who shall be, or shall become a lunatic, may send any such person to any State lunatic asylum by an order under their hands, and in compliance with the provisions of this act.

SEC. 6. In case of the refusal or neglect of any committee or guardian of any lunatic, or his relatives, to confine and maintain him, or where there is no such committee, guardian, or relative of sufficient ability to do so, it shall be the duty of the overseers of the poor, or constables of the city or town where any lunatic shall be found, to report the same forthwith to the superintendent of the poor, who shall apply to the county judge, special county judge or surrogate, who, upon being satisfied upon examination that it would be dangerous to permit such lunatic to go at large, shall issue his warrant, directed to the constables and overseers of the poor of such city or town, commanding them to cause such lunatic to be apprehended and to be sent within the next ten days to some State lunatic asylum, or to such public or private asylum as may be approved by any standing order or resolution of the supervisors of the county, to be there kept and maintained until discharged by law.

SEC. 7. It shall be the duty of the overseers of the poor or constables to whom such warrant shall be directed, to procure a suitable place for the confinement of such lunatic as therein directed pursuant to the preceding section, but in no case shall any lunatic be confined in any other place than a State lunatic asylum or a public or private asylum duly approved as aforesaid, for a longer period than ten days.

SEC. 8. No person, who by reason of lunacy or otherwise, is so far disordered in his mind as to be dangerous to himself or others shall be committed as a disorderly person to any prison, jail, house of correction, or confined therein unless an agreement shall have been made for that purpose with the keeper thereof; and no such lunatic or person disordered in his mind shall be confined in the same room with any person charged with or convicted of any crime, nor shall such lunatic be confined in any prison, jail or house of correction for more than ten days.

SEC. 9. If any person being of disordered mind and committed as a dangerous lunatic to any prison, jail, or house of correction as set forth in the preceding section shall continue to be insane at the expiration of ten days he shall be sent forthwith to some State lunatic asylum, or to such public or private asylum as may be approved as aforesaid.

SEC. 10. Any overseer of the poor, constable, keeper of a jail, or other person, who shall confine any lunatic in any other manner, or in any other place than such as are herein specified, shall be deemed guilty of a misdemeanor, and on conviction thereof shall be liable to a fine not exceeding two hundred and fifty dollars, or to imprisonment not exceeding one year, or to both, at the discretion of the court before which the conviction shall be had.

SEC. 11. If any lunatic, committed under the provisions of this article, or any friend in his behalf, be dissatisfied with any final decision or order of a county judge, special county judge, surrogate, judge of the superior court, or court of common pleas of a city, or police magistrate, he may, within three days after such order or decision, appeal therefrom to a justice of the supreme court, who shall, thereupon, stay his being sent out of the county, and forthwith call a jury to decide upon the fact of lunacy. After a full and fair investigation, aided by the testimony of at least two respectable physicians, if such

jury find him sane, the justice shall forthwith discharge him, or, otherwise, he shall confirm the order for his being sent immediately to an asylum. In case any county judge, special county judge, surrogate, judge of the superior court or common pleas of a city, or police magistrate, refuses to make an order for the confinement of any insane person proved to be dangerous to himself or others if at large, he shall state his reasons for such refusal in writing, so that any person aggrieved may appeal therefrom to a justice of the supreme court, who shall hear and determine the matter in a summary way, or call a jury, as he may think most fit and proper.

SEC. 12. If such lunatic is not possessed of sufficient property to maintain himself, it shall be the duty of the father, mother, or children of such lunatic, if of sufficient ability, to provide a suitable place for his confinement, and to confine and maintain him in such manner as shall be agreeable to the provisions of this act. But in case his relatives are not of sufficient ability to maintain him, then the superintendent of the poor of the county shall, upon his order, send such pauper lunatic to any State asylum, or to such public or private asylum as may be approved by a standing order or resolution of the supervisors, within ten days.

SEC. 13. The overseers and superintendents of the poor shall have the same remedies to compel such relatives to confine and maintain such lunatic, and to collect the costs and charges of his confinement, as are given by law in the case of poor and impotent persons becoming chargeable to any town.

SEC. 14. When a person in indigent circumstances, not a pauper, becomes insane, application may be made in his behalf to any county judge, special county judge, judge of a superior court or common pleas, of the county where he resides, and said judge shall fully investigate the facts of the case, both as to the question of his indigence as well as to that of his insanity. And if the judge certifies that satisfactory proof of his insanity has been adduced, and that such person has become insane within one year next prior to the granting of the order of admission, and that his estate is insufficient to support him and his family (or, if he has no family, himself), while under the visitation of insanity, then it shall be the duty of any judge, before whom an application for that purpose is made, to cause reasonable notice thereof, and of the time and place of hearing the same, to be given to one of the superintendents of the poor of the county chargeable with the expense of supporting such person in a State asylum, if admitted, and he shall then proceed to ascertain when such person became insane, and shall state in his certificate that satisfactory proof has been adduced before him that such person became insane within a year next prior to the date of such certificate. On granting such certificate the judge may, in his discretion, require the friends of the patient to give security to the superintendent of the poor of the county to remove the patient from the asylum at the end of the two years, in case he does not sooner recover. When a patient who is admitted into an asylum on the certificate of any judge, given as hereinbefore recited, has remained in such asylum two years, and has not recovered, the superintendent of the asylum shall send a written notice to the county judge of the county from which he was sent, that such patient has remained in the asylum two years, and has not recovered, and that, in case he is not removed therefrom, the expense of his support will be chargeable to the county until he is so removed, and such expense shall be chargeable to the county accordingly. But in every case where a patient, admitted into an asylum as hereinbefore provided, shall have remained there two years, and has not recovered, the managers of the asylum may, in their discretion, cause such person to be returned to the county whence he came, and charge the expense of such removal to the county. The judge granting said order of indigence, shall file all papers belonging to such proceedings, together with his decision, with the clerk of the county, and report the facts to the supervisors, whose duty it shall be, at their next annual meeting, to raise the money requisite to meet the expenses of support of such indigent lunatic.

SEC. 15. When an insane person in indigent circumstances, not a pauper, shall have been sent to any State asylum by his friends, who have paid his bills therein for six months, if the superintendent shall certify that he is a fit patient, and likely to be benefited by remaining in the institution, the supervisors of the county of his residence are authorized and required, upon an application under oath in his behalf, to raise a sum of money sufficient to defray the expenses of his remaining there another year, and to pay the same to the treasurer of the asylum. And they shall repeat the same for one year more, upon like application, and the production of a new certificate of like import from the superintendent of such asylum.

SEC. 16. The expense of sending any lunatic to a State asylum, and of supporting him there, shall be defrayed by the county or town to which he may be chargeable. If charge-

able to a county, or to any town whose poor-moneys are required to be paid into the county treasury, such expense shall be paid by the county treasurer out of the funds appropriated for the support of the poor belonging to such county or town, after being allowed and certified by the county superintendents. If such lunatic be chargeable to a town whose poor-moneys are not required to be paid into the county treasury, such expense shall be paid by the overseers of the poor thereof.

SEC. 17. The overseers of the poor of any city or town shall have the same remedies to compel the committee or guardian of the estate of any lunatic to confine and maintain such lunatic, and to collect of such committee the cost and charges of his confinement and support, as are given in the preceding sections against the relatives of such lunatic. And the court of general sessions of the peace of the city or county shall make orders against such committee personally, and enforce them in the same manner as against the relatives of any poor person, so long as such committee has any property in his hands, for the support of such lunatic.

SEC. 18. None of the foregoing provisions shall be deemed to restrain or abridge the power and authority of the supreme court, the superior court, and the court of common pleas of the city and county of New York, or the superior court of the city of Buffalo, or the city court of Brooklyn, or any county courts, concerning the safe keeping of any lunatics, or the charge of their persons or estates.

SEC. 19. The county superintendents of the poor shall have all the powers and authority herein given to overseers of the poor of any town.

FORM OF MEDICAL CERTIFICATE.

STATE OF NEW YORK, }
COUNTY OF ———. } *ss.*

I, —— ——, a resident of ———, in the county aforesaid, being a graduate of ———, and having practiced as a physician, hereby certify, under oath, that on the —— day of ———, I personally examined —— ——, of ———, [here insert sex, age, married or single, and occupation,] and that the said —— —— is insane, and a proper person for care and treatment, under the provisions of chapter 446 of the Laws of 1874.

I further certify that I have formed this opinion upon the following grounds, viz.: [here insert facts upon which such opinion rests.]

And I further declare that my qualifications as a medical examiner in lunacy have been duly attested and certified by [here insert the name of the judge granting such certificate.]

Sworn to and subscribed before me this —— day of ———, 188 . }

JUDGE'S CERTIFICATE OF QUALIFICATION.

STATE OF NEW YORK, }
COUNTY OF ———. } *ss.*

I hereby certify that —— ——, of ———, is personally known to me as a reputable physician, and is possessed of the qualifications required by chapter 446 of the Laws of 1874.

LICENSES FOR PRIVATE ASYLUMS.

Laws of 1874, Chapter 447, Title Ninth.

SECTION 1. No person or association shall establish or keep an asylum, institution, house or retreat for the care, custody, or treatment of the insane or persons of unsound mind, for compensation or hire, without first obtaining a license therefor from the State commissioner in lunacy, provided that this section shall not apply to any State asylum or institution, or any asylum or institution established or conducted by any county; and provided, also, that it shall not apply to cases where an insane person or person of unsound mind is detained and treated at his own house or that of some relative.

SEC. 2. Every application for such license shall be accompanied by a plan of the premises proposed to be occupied, describing the capacities of the buildings for the uses intended, the extent and location of grounds appurtenant thereto, and the number of patients of either sex proposed to be received therein; and it shall not be lawful for said commissioner to grant any such license without having first visited the premises proposed to be licensed, and being satisfied by such examination that they are as described, and are otherwise fit and suitable for the purposes for which they are designed to be used.

State Commissioner in Lunacy.

Laws of 1874, Chapter 447.—Title Tenth, as amended by Laws of 1876, Chapter 267.

Section 1. The governor shall nominate, and by and with the advice and consent of the Senate, appoint an experienced and competent physician, who shall be designated as the State commissioner in lunacy, who shall hold his office for five years and receive an annual salary of four thousand dollars, and travelling and other incidental expenses not to exceed one thousand dollars, and a sum not to exceed two hundred dollars to pay office rent and fuel, to be paid on presentation of vouchers to the comptroller.

Sec. 2. It shall be the duty of such commissioner to examine into and report annually to the legislature on or before the fifth day of January, the condition of the insane and idiotic in this State and the management and conduct of the asylums, public and private, and other institutions for their care and treatment. The duties of said commissioner in regard to the insane shall be performed so as not to prejudice the established and reasonable regulations of such asylums and institutions aforesaid; and it shall be the duty of the officers and others respectively in charge thereof, to give such commissioner, at all times, free access to and full information concerning the insane, and their treatment therein. It shall also be the duty of such commissioner to inquire and report, from time to time, as far as he may be able, the results of the treatment of the insane of other States and countries, together with such particulars pertaining thereto as he may deem proper.

Sec. 3. The said commissioner shall have power to make and use an official seal, and all copies of papers and documents in his possession and custody may be authenticated in the usual form under his official seal and signature, and used as evidence in all courts and places in this State, in like manner as similar certificates emanating from any other public officer.

Sec. 4. The said commissioner is hereby empowered to issue compulsory process for the attendance of witnesses and production of papers, to administer oaths, and to examine persons under oath, and to exercise the same powers as belong to referees appointed by the supreme court, in all cases where, from evidence laid before him, there is reason to believe that any person is wrongfully deprived of his liberty, or is cruelly, negligently or improperly treated in any asylum, institution or establishment, public or private, for the custody of the insane; or whenever there is inadequate provision made for their skilful medical care, proper supervision and safe keeping; and if the same shall be proved to his satisfaction, he is further empowered to issue an order in the name of the people of the State and under his official hand and seal, directed to the superintendent or managers of such institution, requiring them to modify such treatment or apply such remedies, or both, as shall therein be specified. And in case such order is disobeyed, or negligently executed, the commissioner may, and it shall be his duty to present such order, with a statement of the facts duly verified upon which it was made, to a justice of the supreme court, who may thereupon, by order, require such superintendent or manager to show cause before such or some other justice of the supreme court at a place in the judicial district where such asylum, institution or establishment is situated, and at a time specified in such order, not less than two days after the service thereof, why an order should not be made directing performance of such order of the commissioner, and on failure to so show cause, the said justice shall make such order, and, for any disobedience of any order made pursuant to the provisions of this section, the same proceedings may be taken to compel performance thereof, or to punish for contempt for such disobedience, as may be had for such purposes in civil actions.

General Statutes, 1878, Chapter 47.

Section 1. The State commissioner in lunacy is hereby empowered to employ a stenographer, whenever any testimony is to be taken before him in the discharge of his official duties, and the charges of such stenographer shall be paid by the comptroller upon presentation of vouchers duly attested: *Provided*, such charges shall not exceed ten dollars per day for the time actually employed, nor one thousand dollars in any one year in the aggregate.

Sec. 2. Whenever the said commissioner shall undertake any investigation into the general management and administration of any asylum, institution or establishment, public or private, for the custody of the insane, he shall give notice thereof to the district-attorney of the county in which such asylum or institution is situated, and it shall, thereupon, be the duty of such district-attorney to appear at such investigation in behalf of the people, and to examine all witnesses who may be in attendance thereat.

COMMITTEES FOR THE INSANE.

See the New York Code of Civil Procedure.—Title VI.

Proceedings for the appointment of a committee of the person and of the property of a lunatic, idiot or habitual drunkard; general powers and duties of the committee.—Secs. 2320–2344.

The provisions of this title are founded mainly upon Laws, 1874, chap. 446, but are extended to habitual drunkards.

DISPOSITION OF THE REAL PROPERTY OF THE INSANE.

See the New York Code of Civil Procedure.—Title VII.

Proceedings for the disposition of the real property of an infant, lunatic, idiot, or habitual drunkard.—Secs. 2344-2364.

NORTH CAROLINA.

[See Laws of North Carolina 1881, chap. 133; chap. 206; chap. 297.]

For admission to asylum, some respectable citizen residing in the county of the alleged insane person shall make and file with the justice of the peace of the county, an affidavit, stating that he has carefully examined the alleged lunatic and believes him to be insane and a fit subject for admission to the asylum.

Such alleged lunatic is then brought before the justice, who shall associate with himself two or more justices of the county, who, together, shall proceed to examine into the condition of such person, and shall take the testimony of at least one respectable physician.

If any two of the justices decide that such person is insane, and some friend will not give security to take proper care of him, then the justices shall cause such person to be removed to an asylum.

The board of directors of the asylum have discretion to determine who are proper persons to receive.

If a person found to be insane has sufficient property and expresses a wish to be placed in some asylum outside of the State, and the justices and physicians who have examined such person deem it proper, he may be sent to the asylum so chosen as a patient.

It is the duty of any person having the legal custody of the estate of such lunatic to supply the funds for his or her support in such asylum if they are sufficient for that purpose, over and beyond maintaining those who may be legally dependent on said estate.

OHIO.

[See Revised Statutes of Ohio (1880), secs. 698–751, 6302–6316, 7242. Laws of 1881, pp. 62 and 102; Laws of 1883, p. 103.]

Each State Asylum is under the charge of a board of trustees.

For the admission of patients to any of the asylums for the insane the following proceedings shall be had; some resident citizen of the proper county shall file with the probate judge of such county, an affidavit, substantially as follows:

STATE OF OHIO, } *ss.*
COUNTY ———. }

——— ——— the undersigned, a citizen of ——— County, Ohio, being sworn, says that he believes ——— ——— is insane (or that in consequence of his insanity his being at large is dangerous to the community). He has a legal settlement in ——— township, in this county.

Dated this — day of ———, A.D. ——. ——— ———.

When the affidavit is filed the judge shall cause the person alleged to be insane to be brought before him, and witnesses, including one physician, to be summoned. If any

person disputes the alleged insanity, such witnesses shall be subpœnaed as are demanded on behalf of the person alleged to be insane. If by reason of the condition of the alleged insane person, it is deemed improper to bring him into the probate court, the judge shall personally visit such person and certify that he has ascertained the condition of such person by actual inspection.

If after hearing the testimony the judge is satisfied that the person is insane, he shall cause a certificate to be made by the medical witness in attendance, which shall set forth full details concerning the patient as specifically provided by the statute, and the judge may then issue a warrant of commitment to the asylum.

The relatives of any person charged with insanity or found to be insane, shall in all cases have the right to take charge of and keep such insane person charged with insanity if they desire so to do, and in such case the probate judge before whom the inquest has been held, shall deliver such insane person to them.

For Admission of Inmates into Longview Asylum.

Some resident citizen of Hamilton County must file with the probate judge thereof, an affidavit substantially as follows:

STATE OF OHIO, }
HAMILTON COUNTY, } *ss.*

The undersigned, a citizen of Hamilton County, Ohio, being sworn, says, that he believes ——— ——— to be insane, and a fit subject for the lunatic asylum; he is a resident of Hamilton County, has a legal settlement in ——— township. These facts are known by ——— ——— and ——— ——— (naming at least two persons).—*Rev. Stats.*, sec. 738.

Proceedings will then be had substantially as given above.

The probate court, upon satisfactory proof, will appoint a guardian for any insane person, which guardian, by virtue of such appointment, shall be also the guardian of the minor children of his ward, unless the court appoint some other person as their guardian.—*Rev. Stats.*, sec. 6302.

OREGON.

[See Laws of Oregon, 1878, p. 72; Laws of Oregon, 1880, p. 49.]

The county judge of any county in this State, upon application of any two householders in his county, in writing under oath, setting forth that any person, by reason of insanity, as the case may be, is suffering from neglect, exposure or otherwise, or is unsafe to be at large, shall cause such person or persons to be brought before him at such time and place as he may direct; and said county judge shall also cause to appear at the same time and place, two or more competent physicians and the prosecuting attorney of his judicial district or his deputy, or (in the event of his absence or inability to attend) some practicing attorney of the State, whose duty it shall be to represent the State and protect its interests, who shall proceed to examine the person or persons alleged to be insane or idiotic, and if the said physicians shall certify upon oath, that the said person or persons are insane or idiotic, as the case may be, and the county judge shall find, from the consideration of the said certificate and the testimony that may be produced before him, that the said person or persons are insane or idiotic, then said judge shall cause the said insane or idiotic person or persons to be conveyed to and placed in charge of the parties contracting to keep and care for the insane and idiotic of this State: *Provided*, that an appeal shall lie from the decision of the said county judge in such cases, in the same manner as is provided for appeal from the judgments of county courts in other cases, which appeal may be taken either by the householders making such application, or by or on behalf of any person who shall be adjudged to be insane or idiotic; or the same may be taken by the State whenever, in the judgment of the prosecuting attorney for the district, the interest of the State requires such appeal to be taken: *Provided further*, that the county judge shall make diligent inquiries, and when any insane or idiotic person committed under this act, shall be found to own any estate, real or personal, said judge shall immediately, without further petition or notice, appoint a guardian for the estate of such person, who shall execute his trust under the direction of said court, make the same re-

turns and give the same security as in case of the estate of a minor, and such estate shall be liable to the county for the cost of such commitment, and to the State for the costs of conveying such insane or idiotic person to the asylum.—*Laws of* 1878, p. 72.

The governor, secretary of state and State treasurer were, in 1880, designated as commissioners for the purpose of erecting a suitable State Insane Asylum.—See *Laws*, 1880, p. 49.

PENNSYLVANIA.

[See Laws of 1869, No. 54, and "An act relative to the supervision and control of hospitals or houses in which the insane are placed for treatment or detention." Approved the 8th day of May, 1883.]

SECTIONS 1–6, inclusive, refer to the appointing and managing of the members of the State Board of Charities, and their Committee on Lunacy, their duties, etc.

SEC. 7. The board shall have power from time to time, with the consent of the chief justice of the supreme court and of the attorney-general, to ordain rules and regulations on the following matters, so far as the same are not inconsistent with any laws of this Commonwealth then in force and of any provisions of this act.

(1.) The licensing of all houses or places in which any person can be lawfully detained as a lunatic or of unsound mind, upon compensation paid to or received by the owner or occupant of such house or place directly or indirectly for the care of such lunatic, and also of all houses or places in which more than one person of unsound mind is detained or resides: *Provided*, That this clause shall not extend to any gaol or prison; and *provided also*, That the board, with consent as aforesaid, may from time to time exempt any particular hospital established by the State or under any municipal authority, or any eleemosynary institution, from the obligation to apply for or obtain a license; and no such institution now existing shall be required to take out a license until required to do so by the board with the consent aforesaid.

(2.) Regulations to insure the proper treatment of persons detained in any house or place, whether licensed or not, that are subject to the provisions of this act, and to guard against improper or unnecessary detention of such persons.

(3.) Regulations of the forms to be observed warranting the commitment, transfer of custody, and discharge of all lunatics other than those committed by order of a court of record, and as to these, with the consent of the presiding judge of the court under whose order the person is detained.

(4.) The visitation of all houses or places licensed under this act, or in which any persons are detained as lunatics, and of all persons detained therein.

(5.) The withdrawal of such licenses, and the imposition of conditions under which they shall continue.

(6.) Reports and information to be furnished by the manager or managers of all houses or places, subject to the provisions of this act and by the boards of visitors.

(7.) Regulations as to the number of persons that may be detained and the accommodations to be provided, and food, clothing, fuel to be furnished in any house or building subject to the provisions of this act, the manner of such detention and the restraints imposed, the means of communication by those detained with the relatives, friends, and other persons outside the houses and places of detention.

SEC. 8. There shall be appointed boards of visitors of all houses or places licensed under or subject to the provisions of this act, or in which any person of unsound mind is detained, and for the care or custody of whom compensation of any kind is received, or where more than one such person is detained. One such board shall be appointed in every county in which there is a house or place subject to the provisions of this act, of not less than three persons, and in each county, where there are more than one such house or place, the number constituting the board of visitors of such county shall be increased in the discretion of the committee on lunacy.

SEC. 9. The members of the board of visitors shall be appointed by the board in each year, and shall continue until their successors are appointed, and the board may remove the visitors and fill vacancies in the office.

SEC. 10. Women may be appointed members of the board of visitors, and at least once a year these boards shall be filled up so that members who have failed to act shall be removed.

SEC. 11. It shall not be lawful for any person or persons, or corporation, not excepted from the obligation, to obtain a license under this act to keep or maintain a house or place for the reception or custody of persons of unsound mind without having received a license under this act, nor when such license has expired or been withdrawn, or suspended; and the manager and occupant of any such house, within which more than one person shall be detained as being a person of unsound mind, for compensation received, and the manager and occupant of any such house or place, wherein more than one person is received and detained, with or without compensation, and while there is no license in force authorizing the keeping of such house or place, shall be deemed guilty of a misdemeanor.

SEC. 12. Any person having charge or control of any house or place subject to the provisions of this act, used for the detention, care, or custody of a lunatic, who shall violate or omit to observe any regulation of the committee on lunacy authorized by this act, after a copy of the same has been left at the said house or place, or delivered to the person named in the license, or to the manager of such house, shall be deemed guilty of a misdemeanor, and all common-law rights of action or indictments are also reserved.

SEC. 13. The Board of Public Charities shall from time to time provide for an effectual visitation of all persons confined as insane in all places over which they are given jurisdiction by this act, and an inspection of such houses or places of confinement and of the mode of treatment of the insane.

SEC. 14. The board shall make rules to insure to the patients the admission of all proper visitors, being members of their family, or personal friends, agents, or attorneys, and compel obedience to such regulations.

SEC. 15. The detention of any person as insane in any house or place made subject to the provisions of this act, without compliance with the requisitions of this act, shall be a misdemeanor on the part of any person concerned in such detention, who has omitted or permitted the omission of any of the requirements, and the party aggrieved shall also be entitled to his action for damages.

SEC. 16. No verdict or judgment shall be entered in any action, nor shall any judgment be entered on any indictment for such detention as against any person or persons who are subject to the regulations and provisions of this act, who shall have complied with the requirements of this act, unless the judge, after trial and verdict, shall certify that there was proof to his satisfaction that the party charged acted with gross negligence or corruptly, or that he acted without reasonable or probable cause, or was actuated by motives other than the good of the person restrained.

SEC. 17. In all buildings or establishments where an insane person is detained, which are subject to the provisions of this act, there shall be kept the following books, which shall be at all times open to the inspection of any member of the committee on lunacy, or the board of visitors of the proper county.

An Admission Book.

A Discharge Book.

A Case Book, in which there shall be regularly entered all the facts bearing on each patient and his case.

A Medical Journal, in which there shall be at least once a week a statement written of all matters which are of special importance bearing on the treatment and condition of the patients.

SEC. 18. No person shall be received as a patient for treatment or for detention into any house or place where more than one insane person is detained, or into any house or place where one or more insane persons are detained, for compensation, without a certificate signed by at least two physicians, resident in this Commonwealth, who have been actually in the practice of medicine for at least five years, both of whom shall certify that they have examined separately the person alleged to be insane, and, after such an examination had, do verily believe that the person is insane, and that the disease is of a character which, in their opinion, requires that the person should be placed in a hospital or other establishment where the insane are received for care and treatment, and that they are not nearly related by blood or marriage to the person alleged to be insane, nor in any way connected as a medical attendant or otherwise with the hospital or other establishment in which it is proposed to place such person.

SEC. 19. The certificate above provided for shall have been made within one week of the examination of the patient and within two weeks of the time of the admission of the patient, and shall be duly sworn to or affirmed before a judge or magistrate of this commonwealth, and of the county where such person has been examined, who shall certify to the genuineness of the signatures and to the standing and good repute of the signers.

And any person falsely certifying as aforesaid shall be guilty of a misdemeanor and also liable civilly to the party aggrieved.

SEC. 20. No person alleged to be insane shall be received into any house for treatment or for detention unless at the time of such reception the person or persons at whose instance the person is received shall, by a writing signed, state that the person has been removed and is to be detained at his or her request under the belief that such detention is necessary and for the benefit of the insane person.

SEC. 21. There shall also be delivered to the person or persons having supervision or charge of the house a written statement of the following facts relative to the person to be detained, signed by the person or persons at whose instance the insane person has been removed and detained, or if the facts be not known it shall be so stated: 1. The name. 2. Age. 3. Residence for the past year, or for so much thereof as is known. 4. Occupation, trade or employment. 5. Parents, if living. 6. Husband or wife. 7. Children. 8. Brothers and sisters, and the residence of each of these persons. 9. If not more than one of these classes is known, the names and residence of such of the next degree of relatives as are known. 10. A statement of the time at which the insanity has been supposed to exist, and the circumstances that induce the belief that insanity exists. 11. Name and address of all medical attendants of the patient during the past two years.

SEC. 22. Should the person in charge of the house have reason to believe that any of these statements have been omitted through ignorance, and that the answers will be immediately furnished, and no reason existing to doubt the good faith of the parties, after inquiring of the person intended to be detained, it shall be lawful to detain the person alleged to be insane for such further period as shall be necessary to obtain the said statements complete, but not exceeding seven days.

SEC. 23. Within twenty-four hours after any person is received into any house for detention as an insane person, the person in charge there shall enter or have entered in a book kept for that purpose, all the facts stated in the certificate or documents required to be exhibited at the time of receiving the patient, and shall file the originals and preserve them. The regular medical attendant of the house shall, within twenty-four hours after the reception of any patient, examine such patient and reduce to writing the results of such examination, and enter the same upon a book to be kept for that purpose, together with the opinion formed from such examination and from the documents received with the patient.

SEC. 24. In case the said medical attendant is of the opinion that the detention is not necessary for the benefit of the patient, he shall notify the person or persons at whose instance the patient is detained, and unless such person shall without a delay not exceeding seven days exhibit satisfactory proof of such necessity, the patient shall be discharged from the house and restored to his family or friends.

SEC. 25. At the time of such examination the medical attendant shall himself cause the patient distinctly to understand, if he or she is capable of doing so, that if he or she desires to see or otherwise communicate with any person or persons, means will be provided for such interview or communication, and said attendant shall personally see that proper means are taken to communicate this fact to the person or persons indicated by the patient, and any proper person or persons not exceeding two shall be permitted to have a full and unrestrained interview with the patient.

SEC. 26. The statements furnished at the time of the reception of the patient, and at the examination of the patient by the medical attendant of the house, shall be forwarded by mail to the address of the committee on lunacy within seven days from the time of the reception of the patient, which shall by them be entered in a book, which they shall keep for this purpose, and at least once in six months there shall be a report made by the medical attendant of the house on the condition of each patient, together with such other matters relative to the case as the said committee may require, and at any time such report shall be made upon the request of the committee on lunacy.

SEC. 27. During the detention of any person as insane any medical practitioner designated by him or by any member of his family or "near friend," with the sanction of a judge of a court of record of the county in which such insane person resided at the time of his removal and detention, shall be permitted at all reasonable hours to visit and examine the patient, and such medical attendant shall, unless objected to by the patient, be permitted, by request of his or her family or "near friend," and with the consent of the physician in chief of the establishment, to attend the patient for all maladies other than insanity, in the same manner as if the patient were in his own home.

SEC. 28. All persons detained as insane shall be furnished with materials and reason-

able opportunity, in the discretion of the superintendent or manager, for communicating, under seal, with any person without the building, and such communication shall be stamped and mailed. They shall have the unrestricted privilege of addressing communications, if they so desire, not oftener than once a month, to any member of the committee on lunacy.

SEC. 29. The provisions of this act in respect of the admission or discharge of patients shall not extend to insane criminals in custody. Such persons shall not be received except when delivered by a sheriff of the county or his deputy, together with an order of the court of the county in which he was arrested or convicted, having jurisdiction of the offence, under the seal of the court, and signed by a law judge, nor shall such criminals be discharged from a hospital or other place of detention for the insane saving on a like order, and to the sheriff or his deputy producing such order, and while detained as an insane person, such criminal shall be so kept as to insure his detention until duly discharged. Whenever any person detained in any gaol or prison is insane or in such condition as to require treatment in a hospital for the insane, it shall be the duty of any law judge of the court under whose order the person is detained, upon application, to direct an inquiry into the circumstances, either by a commission or otherwise as he shall deem proper, with notice to the committee on lunacy, and if the judge shall be satisfied that the person confined requires treatment in a hospital, he shall thereupon direct the removal of the said person from the gaol or prison to a state hospital, which order shall be executed by the sheriff of the county or his deputy, and the actual expenses of such removal and the expenses of maintaining the person in the hospital shall be paid by the county liable for the maintenance of the said person in the gaol or prison from which he is removed.

SEC. 30. The trustees, managers, and physician of any hospital, in which a criminal is confined by order of any court, or in which a lunatic has been committed after an acquittal of crime, shall not discharge, release, or remove the prisoner or lunatic, without the order of a court of competent jurisdiction; and in case such lunatic, whether a convict or acquitted, is not set at large, but is to be removed to any place of custody, other than a hospital, the order for removal shall not be made without notice to the committee of lunacy, and time given them to investigate the case and be heard on the application.

SEC. 31. All persons that have been detained as insane (other than criminal insane, duly convicted and sentenced by a court) shall, as soon as they are restored to reason, and are competent to act for themselves, in the opinion of the medical attendant of the house, be forthwith discharged, and any person so detained shall at all times be entitled to a writ of *habeas corpus* for the determination of this question; and, on the hearing, the respondent in that writ shall be required to pay the costs and charges of the proceeding, unless the judge shall certify that there was sufficient ground, in his opinion, to warrant the detention and put the petitioner to his writ. In case the discharged patient be in indigent circumstances, such person shall be furnished with necessary raiment, and with funds sufficient for sustenance and travel to his home, to be charged to the county from which such patient was committed.

SEC. 32. The committee on lunacy shall be notified of all discharges within seven days thereafter, and a record of the same shall be kept by the committee.

SEC. 33. The committee on lunacy may at any time order and compel the discharge of any person detained as insane (other than a person committed, after trial and conviction for crime, or by order of court), but such order shall not be made, unless notice be given to the person having charge of the building in which the patient is detained, and to the person or persons at whose instance the patient is detained, and reasonable opportunity given them to justify a further detention; and the committee shall not sign an order of discharge unless they have personally attended and examined the case of the patient.

SEC. 34. Persons voluntarily placing themselves in any of the houses provided for in this act, may be detained for the time they shall specify by an agreement signed by them at the time of their admission, but not exceeding seven days, and they may from time to time renew the authority to detain them for a time not exceeding seven days from such renewal. But no agreement shall be deemed to authorize a detention unless signed in the presence of some adult person, attending as a friend of the person detained, in the presence of, and also by the person in charge of the house, or the medical attendant.

SEC. 35. So much of the act entitled "An act to provide for the admission of certain classes of the insane into hospitals for the insane in this Commonwealth, and their discharge therefrom," approved the twentieth day of April, Anno Domini one thousand eight hundred and sixty-nine, number fifty-four of the Pamphlet Laws of that year, as provides "that insane persons may be placed in a hospital for the insane by their legal guardians, or by their relatives or friends, in case they have no guardians, but never without

the certificate of two or more reputable physicians, after a personal examination made within one week of the date thereof, and this certificate to be duly acknowledged and sworn to, or affirmed, before some magistrate or judicial officer, who shall certify to the genuineness of the signatures, and to the respectability of the signers," is amended, and the persons thereby authorized to place an insane person in a hospital are required to observe the forms and conditions required by this act in exercising the powers conferred by the said act of the twentieth day of April, Anno Domini one thousand eight hundred and sixty-nine, when the insane person is placed in any house, hospital, or place which is subject to the provisions of this act.

SEC. 36. So much of said act as provides by section second, "That it shall be unlawful, and be deemed a misdemeanor in law, punishable by a fine of not exceeding one hundred dollars, for any superintendent, officer, physician, or other employé of any insane asylum, to intercept, delay, or interfere with, in any manner whatsoever, the transmission of any letter, or any other written communication, addressed by an inmate of any insane asylum to his or her counsel residing in the county in which the home of the patient is, or in the city or county in which the asylum is located," is hereby amended so that the same shall extend to the superintendents, officers, physicians, servants, or other employés of all hospitals, houses, or places which are subject to the provisions of this act.

SEC. 37. So much of the said act as provides by section ten, "If the superintendent or officers of any hospital for the insane shall receive any person into the hospital, after full compliance with the provisions of this act, no responsibility shall be incurred by them for any detention in the hospital," as applies to the superintendent or officers of any hospital, house, or place made subject to the provisions of this act, is repealed, and, in place of the provisions of that act for the protection of such superintendents or officers, the provisions of this act for that purpose are substituted.

SEC. 38. The managers and officers of any licensed hospital, or licensed house, or place, shall not be liable to the penalties imposed by this act, and shall be entitled to all the protection of this act in case of receiving for detention a lunatic, or alleged lunatic, without complying with the requisitions of the act, if the judge trying the cause shall certify that the said officers and managers had good reason to believe that such receiving and detention were necessary for the safety of the lunatic, or other persons, and that the delay required to comply with the requirements of this act would have been injurious to the person detained, or to other persons, and that there is no reason to believe that they or any of them were actuated by improper motives. And within forty-eight hours after any person is thus received all the requisitions of this act to authorize a detention shall have been complied with, or the person discharged from custody, and the officers of the hospital or place where such lunatic has been thus received, shall forthwith notify the Board of Public Charities of the facts connected with the reception and detention.

SEC. 39. Whenever any person shall be found by inquisition to be insane, the committee of the person, or of the estate, and also the clerk of the court into which the inquisition has been returned, shall thereupon forthwith send to the committee on lunacy at their principal office, a statement in writing, signed by the committee of the lunatic, of the name, age, sex, and residence of the lunatic, and the residence of the committee, and upon any change in the residence or place of detention of the lunatic, shall forthwith notify the committee of lunacy of such change. The committee on lunacy, or any one or more of the members of the committee, shall have power to visit and examine the said lunatic, and authorize such visiting and examination by their secretary, or any board of visitors, or one or more members thereof, and by a physician, and the said committee are authorized to apply to any court having jurisdiction over the committee, or to a judge of a court of common pleas of the county in which the lunatic is a resident or detained, to make such orders for the maintenance, custody, or care of the said lunatic, and for the care and disposition of the property of the lunatic, as the case may require. From any order, final or otherwise, thus made, an appeal may be taken to the supreme court, but such appeal shall not be a *supersedeas*, unless so ordered by the court making the order, or by a judge of the supreme court, on application and a hearing.

SEC. 40. This act shall go into operation, etc.

RHODE ISLAND.

[Public Statutes of Rhode Island, 1882, title xii., chap. 74.]

Any trial justice or clerk of a justice court, upon complaint in writing, under oath, that a person within the county is a lunatic, or is furiously mad and is at large, shall cause such person to be apprehended and brought for examination before the court.

If the court adjudge such complaint true, it shall commit such person to a hospital or asylum for the insane, unless a satisfactory recognizance be given that such person shall not be permitted to go at large.

Upon proper petition under oath, setting forth that any person is insane, any justice of the supreme court may appoint not less than three commissioners to investigate and report whether such person should be placed in a hospital or asylum for the insane. Such commissioners shall be sworn to the faithful execution of their duties, shall give notice to person complained of as to time and place of hearing that he may defend himself by counsel or otherwise, and said commissioners may summon witnesses, and shall hear all evidence offered on either side.

The justice may cause such person complained of to be apprehended pending the inquisition of the commissioners.

The justice may confirm or disallow the report of the commissioners, and may order the person complained of to be confined in an asylum, or may dismiss the petition altogether.

Any person so committed to an asylum may be discharged by an order of any justice of the supreme court, although not restored to sanity, upon the written recommendation of the trustees and superintendent of such institution.

Insane persons may be placed in State asylums by their relatives or friends, or, if paupers, by the town authorities; but the superintendents of such asylums or hospitals shall not receive any person into custody without a certificate from two practicing physicians of good standing that such person is insane.

Upon the application of a relative or friend, and with the written approbation of the visiting committee of the trustees, the superintendent of such institution may discharge any patient not committed by process of law.

Any justice of the supreme court may, in his discretion, upon petition, setting forth that a person is improperly detained in an insane asylum, appoint commissioners to investigate such case. No notice is served upon the person confined, and neither the petitioner nor his counsel has the right to visit or examine said insane person except by permission of the superintendent of the asylum, or by special order of the justice issuing the commission. The personal examination by said commissioners must take place at the institution where such person is confined, and, if the commissioners prefer, without the presence of the superintendent.

Such commissioners shall report to the justice, who may either confirm or disallow the same, and order the discharge of the person detained, or dismiss the petition, in his discretion.

The writ of *habeas corpus* not to be impaired or abridged by anything in this chapter.

Whenever, on the trial of any person upon an indictment, he is acquitted, on the ground of insanity, the jury shall so state, and the court, if the going at large of such person is deemed dangerous, shall certify its opinion to that effect to the governor, who may cause such person to be removed to an asylum and detained during the continuance of such insanity.

Any justice of the supreme court may, upon proper petition, order an examination of any person confined in any jail or prison, and if such person is found to be insane or idiotic, or in such a state of impairment of mind or body as tends directly thereto, may order the removal of such prisoner to an asylum.

Upon restoration to reason or health, such person may be remanded to the place of his original confinement by any justice of the supreme court.

The agent of State charities and corrrection and the secretary of State shall constitute a commission to receive and examine all complaints and letters from or in relation to any inmate of any insane asylum, or any person alleged to be insane restrained of his liberty.

They may, in their discretion, cause an examination to be made, and may petition a supreme court justice for a formal investigation. Such justice may thereupon, in his discretion, cause such person so restrained to be discharged.

Such commission from time to time, in its discretion, shall visit all asylums or institutions for the insane and examine into the condition and complaints of anyone so confined.

Superintendents and others in charge, where any insane person is confined, must in no way hinder or prevent any person so confined from communicating with said commission, and must forward all communications to such commission without delay.

Whenever the agent of State charities and correction shall make complaint to the supreme court that any person, reputed to be idiotic, lunatic, or insane, is not humanely or properly cared for, or is improperly restrained of his liberty, the court shall cause examination to be made, and, if found true, such person shall be removed to the State Asylum for the Insane.—Secs. 1–40 inclusive.

SOUTH CAROLINA.

[See General Statutes of South Carolina, 1882, secs. 52, 899, and 1584–1604 inclusive; also secs. 2697–2698; also Code of Civil Procedure, as adopted, 1881–1882, secs. 37 and 70.]

South Carolina Lunatic Asylum is in charge of and controlled by nine regents appointed by the governor.—*Gen. Stats.*, secs. 1584 *et seq.*

Admission to asylum shall be as follows:

1. All persons who shall be found idiots, or lunatics, by inquisition from the probate or circuit courts, or on trials in the circuit where the court shall order such admission.

2. Where it shall be requested under the hand of the husband or wife, or (where there is no husband or wife) of the next of kin of idiot or lunatic.

3. All persons who shall be declared lunatics, idiots, or epileptics, after due examination by one trial justice and two licensed practicing physicians of the State. Where the subject is a pauper, the admission shall be at the request of the county commissioners of the county wherein such pauper has a legal settlement; otherwise the admission shall be at the request of the husband or wife, or, where there is no husband or wife, of the next of kin of the idiot, lunatic, or epileptic.—*Gen. Stats.*, sec. 1586.

In criminal cases, judges may send persons *non compos mentis* to asylum.—*Gen. Stats.*, sec. 1589.

The judge of the probate court may commit to the asylum any dangerous lunatic.—*Gen. Stats.*, sec. 1590; *Code of Civil Procedure*, sec. 70.

No person committed after examination by trial justice and two physicians, or who shall be sent from a sister State, shall be retained more than ten days without an order for his retention, entered in the records of the institution, after examination by the medical attendants and at least three of the regents; all papers must then be sent to the probate judge of the county where such lunatic resides.—*Gen. Stats.*, sec. 1591.

It is the duty of the regents to dismiss and cause to be indicted any person employed in the asylum who shall assault or use unnecessary violence towards any inmate.—*Gen. Stats.*, sec. 1596.

Every judge of probate in his county has jurisdiction in cases of lunacy, and in relation to the appointment and removal of guardians for the insane, and the care and disposition of the estates of their wards.—*Code of Civil Procedure*, secs. 37 and 38.

TENNESSEE.

[See General Statutes (Revision, 1871), secs. 1517–1564, and secs. 3681–3719; Laws of 1871, p. 159; Laws of 1877, p. 71; Laws of 1883, p. 195.]

The management of the State asylums is vested in a State board of nine trustees, appointed by the governor, by and with the advice and consent of the Senate.—*Laws of* 1877, p. 71; and *Laws of* 1883, p. 195.

For admission of a paying patient to the asylum, thirteen weeks' charge must be paid in advance, a bond given for further necessary payments and expenses, and a certificate by at least one respectable physician must be filed with the superintendent.

FORM OF CERTIFICATE.

The undersigned, being a physician in regular practice, hereby certifies that on the —— day of ———, 18 — , I personally examined ——— ———, of ——— County, State of Tennessee, and pronounce —— insane, and a fit subject of care and treatment in a hospital for the insane. The patient is —— years of age; is free from infectious disease; has been insane for ———; the disease is (or is not) hereditary; the supposed predisposing and exciting causes are ———; is not subject of epilepsy; has (or has not) attempted to commit violence on ——self or others.

This certificate should contain all facts known to the maker regarding the insanity of the patient, and should be signed and attested by a justice of the peace.

For admission of non-paying patients, a statement having been filed with the justice of the peace, alleging the insanity of the patient in question, and giving the names of witnesses, including one physician, who can prove the same, the justice shall issue subpœnas to the witnesses named, and such others as he may deem proper. If, after such inquest, the justice is satisfied of the truth of the allegations set forth in the statement, he shall cause the physician in attendance to make out a certificate, shall himself certify to his inquest, and attest the signature of the physician under seal, and transmit the same to the clerk of the county court, who shall take the necessary steps for the commitment of such insane person to the asylum.—*Laws of* 1871, pp. 159–163.

For proceedings for appointment of guardians for lunatics, see Gen. Stats., sec. 3681 *et seq.*

TEXAS.

[See Laws of Texas, third edition, Vol. II.; Paschal's Annotated Digest, secs. 5828–5835; and p. 1115, art. 5, sec. 7; and sec. 5462. Laws of 1876, chap. 95.]

If information in writing be given to any county judge that any person in his county is a lunatic, and requires restraint, and said county judge shall believe such information to be true, he shall order such person to be brought before him, and a jury to be summoned. If the jury find that such person is insane, he shall be sent to the asylum, unless some friend will give a bond to restrain and take proper care of such lunatic.

A copy of all the proceedings shall be forwarded to the superintendent of the asylum before sending a patient there.

The district court has exclusive jurisdiction over the estates of the insane.

Guardians are appointed, who have the care of the persons and estates of the insane, subject to the control of the courts.

VERMONT.

[Revised Laws of Vermont, 1880. Laws of 1882, pp. 54–58.]

SUPERVISION OF THE INSANE.

SEC. 2897. The general assembly shall elect biennially, three supervisors of the insane, who shall hold their offices for two years commencing on the first day of the next December; and the governor may fill any vacancy in the board during said term. Two of said supervisors shall be physicians, and none of them shall be a trustee, superintendent, employé, or other officer, of an insane asylum in the State.

SEC. 2898. The supervisors shall visit every asylum for the insane in the State as often as occasion requires, and one of the board, as often as once a month, shall examine into the condition of said asylums, the management and treatment of the patients therein, their physical and mental condition and medical treatment, hear the grievances of the patients apart from the officers and keepers, and investigate the cases that in their judgment require special investigation, and particularly shall ascertain whether persons are confined in any asylum who ought to be discharged, and shall make such orders therein as each case requires.

SEC. 2899. The supervisors shall make report biennially to the governor and the gen-

eral Assembly of their doings, and the conditions of the asylums and patients therein, their physical and medical treatment and the discipline thereof, and of such matters as they deem advisable.

SEC. 2900. The supervisors may administer oaths, summon witnesses before them in any case under investigation, and discharge by their order, in writing, any person confined as a patient in any asylum for the insane, whom they find on investigation to be wrongfully confined, or whom they find so far sane as to warrant the discharge. But convicts sent to an asylum from the State prison or house of correction who are found sane before expiration of their sentence, shall not be discharged, but the supervisors shall order them returned to the prison or house of correction. In no case shall the supervisors order the discharge of a patient without giving the superintendent of the asylum an opportunity to be heard.

SEC. 2901. The governor may refer the case of any patient in the asylums for the insane to the supervisors for their investigation. And the supervisors shall investigate such cases, and by their orders grant such relief as each case requires; but if they have not the power to grant the necessary relief, they shall, if the patient is one of the insane poor of the State, at the expense of the State, cause such proceedings to be commenced in court as are required to obtain the necessary relief and promote the ends of justice and humanity.

SEC. 2902. The friends or relatives of a patient in an asylum for the insane may apply to the supervisors, by petition or otherwise, to inquire into the treatment and confinement of such patient, and the supervisors shall take such action upon such application as it requires.

SEC. 2903. If in their judgment an investigation is necessary, they shall appoint a time and place for hearing, and give such friends and relatives, and the superintendent of the asylum reasonable notice thereof, and at the time appointed shall hear such friends or relatives and superintendent, and make such lawful orders as the case requires. But in no case shall the supervisors order a discharge of a patient without giving the superintendent an opportunity to be heard.

SEC. 2904. If a person legally summoned as a witness before the supervisors in behalf of State, or summoned by other parties, with a tender of his fees, wilfully or wrongfully refuses to attend or testify, he shall be punished as provided in section 1546 (sec. 1661).

SEC. 2905. If a trustee, superintendent, employé or other officer of an asylum for the insane, wilfully and knowingly neglects or refuses to discharge a patient after such patient has become sane or after the supervisors have ordered his discharge, such trustee, superintendent, employé or other officer shall be fined not more than five hundred dollars.

REGULATIONS CONCERNING ADMISSION TO INSANE ASYLUMS.

SEC. 2906. No person, except as hereinafter provided, shall be admitted to or detained in an insane asylum as a patient or inmate, except upon the certificate of such person's insanity made by two physicians of unquestioned integrity and skill, residing in the probate district in which such insane person resides, or, if such insane person is not a resident of the State, in the probate district in which the asylum is situated, or if such insane person is a convict in the State prison or house of correction, such physicians may be residents of the probate district in which such place of confinement is situated; and the two physicians making such certificate shall not be members of the same firm, and neither shall be an officer of the insane asylum in this State. [As amended by Laws of 1882; also see *Note*.]

SEC. 2907. Such certificate shall be made not more than ten days previous to the admission of such insane person to the asylum, and, with a certificate of the judge of probate of the district in which the physicians reside, that such physicians are of unquestioned integrity and skill in their profession, shall be presented to the proper officer of the asylum at the time such insane person is presented for admission.

SEC. 2908. The certificates of the physician shall be given only after a careful examination of the supposed insane person made not more than five days previous to making the certificate, and the physician who signs a certificate without making such previous examination, shall, if the person is admitted to an asylum upon the certificate, be fined not less than fifty dollars nor more than one hundred dollars.

SEC. 2909. A person may be received into an asylum without a certificate, upon the order or sentence of the supreme or county court, upon the presentation of a certified copy of the order or sentence.

SEC. 2910. A person admitted to an asylum agreeably to the provisions of this chapter shall be deemed insane and shall be subject to the control and sanitary treatment of the trustees of the asylum, until sufficiently sane to warrant his release, or until removed by his friends or guardians, or otherwise discharged.

SEC. 2911. A trustee or other officer or employé of an insane asylum who admits or detains a person in an asylum, contrary to the provisions of this chapter, shall be imprisoned in the State prison not more than three years.

SEC. 2912. The secretary of state shall prepare and have printed and furnished to each probate judge, blank certificates for the use of such judges and physicians in carrying out the provisions of this chapter.

CHAP. 87, SEC. 1702. When a person held in prison on a charge of having committed an offence is not indicted by the grand jury by reason of insanity, the grand jury shall so certify to the court, and thereupon, if the discharge or going at large of such insane person is deemed manifestly dangerous to the community, the court may order him confined in the county jail or in the insane asylum at Brattleboro, or some other suitable place, at his own expense, if he has estate sufficient for that purpose, and if not, at the expense of the State.

SEC. 1703. When a person tried on an indictment or information for any crime or offence is acquitted by the jury by reason of insanity, the jury, in giving their verdict of not guilty, shall certify that it is given for such cause, and thereupon, if the discharge or going at large of such person is considered dangerous to the community, the court may order him, in its discretion, to be confined in the State prison or in the insane asylum at Brattleboro, on such terms as the court directs. Also see Laws of 1882, No. 49.

NOTE.

Laws of 1882, No. 48.

SEC. 2. The next friend or relative of a person whose insanity is certified to as above provided, may appeal from the decision of the physicians so certifying him to be insane to the supervisors of the insane, which appeal shall be noted on the certificate. The supervisors shall, when such appeal is taken, forthwith examine the case, and, if in their opinion there was not sufficient ground for making such certificate, they shall avoid the certificate, otherwise they shall indorse their approval upon it. Such examination by the supervisors shall be had in the town where the appellant resides.

SEC. 3. When the next friend or relative of such a person takes an appeal as above provided, he shall not be received in an insane asylum while the appeal is pending before the supervisors. And a trustee or other officer or employé of an insane asylum who receives or detains a person in such asylum whose insanity is not attested by a legal certificate which has not been appealed from, or by a certificate duly approved by the supervisors on appeal, shall be imprisoned in the state prison not more than three years.

SEC. 4. Idiots and persons *non compos*, who are not dangerous, shall not be confined in an asylum for the insane. And if any such persons are so confined the supervisors of the insane shall cause them to be discharged.

For special act to prevent the going at large of lunatics see Laws of 1882, No. 47.

VIRGINIA.

[See Code of Virginia, 1873, Title 24, chap. 82, p. 714; Title 55, chap. 201, sec. 14, p. 1241; Title 55, chap. 202, sec. 17, p. 1247; Acts of Assembly 1874, chap. 26; Acts of Assembly 1881–2, chap. 133.]

Each lunatic asylum in the State shall be under the management of a board of eleven directors, appointed by the governor.

The directors may examine persons brought to the asylum as lunatics, and order those found to be such to be received.

Any justice may cause any person suspected of being a lunatic to be brought before him, and he and two other justices shall inquire into the case, and for that purpose summon the physician of such person (if any) and other witnesses. Questions to be asked such witnesses are prescribed by statute. If the justices decide that such person

is a lunatic, and ought to be confined, they may either surrender him to some person who will give a sufficient bond for his care, or cause him to be removed to an asylum. Upon the arrival of such patient at the asylum, the board of directors is assembled, and, if they concur in opinion with the justices, the patient is received.

A committee shall be appointed for any person found insane, and such committee shall be entitled to the custody and control of his person when not confined in an asylum or jail, and shall take possession of and manage and care for his estate.

Where a court sees reasonable ground to doubt the sanity of a person held for trial, it shall suspend the trial and order a special jury to inquire into the fact. If the jury find the accused sane at the time of their verdict, no other inquiry is made and the trial proceeds; if they find him insane, they then inquire whether he was so at the time of the alleged offence. If they find that he was, the court may dismiss the prosecution; if they find that he was not, the court shall commit him to jail or asylum until he is so restored that he can be put upon his trial.—*Code*, p. 1247, chap. 202, title 55.

WEST VIRGINIA.

[See Revised Statutes of West Virginia (1879), chap. 108 (chap. 58 of Code), p. 673; Acts of W. Va., 1881, p. 266; Acts of W. Va., 1882, pp. 133–137.]

The State Asylum is under the control of a board of nine directors, appointed by the governor, with the advice and consent of the Senate.

Any one or more of the directors, together with the superintendent (who is a physician), shall constitute an examining board, and may examine persons brought to the asylum as lunatics, and order those found to be such to be received.—*Acts of W. Va.*, 1882, p. 135.

Any justice suspecting a person in his county to be a lunatic, may issue a warrant and cause such person to be brought before him, and an inquiry to be had, after summoning a physician and any other witnesses. If such person be sent to the asylum, and the examining board refuse to receive him, because, in their opinion, he is not a lunatic, they shall so certify, and such person shall be conveyed back to the county in which he was examined and there discharged.—*Ibid.*

The courts may appoint a committee for any insane person.

Such committee is entitled to the custody and control of the person of his ward, when he resides in the State and is not confined in the hospital or jail, and to the care and control of his estate. Suitable bonds must be given, and such committee is under the supervision and control of the courts.

WISCONSIN.

[See Revised Statutes of Wisconsin (1878), secs. 580–609; Laws of 1880, chap. 266; Laws of 1881, chap. 202 and chap. 298; Laws of 1882, chap. 283; Laws of 1883, chap. 35.]

The State asylums are under the control of the "State Board of supervision of Wisconsin charitable, reformatory and penal institutions." The board consists of five members who receive salaries, and who are appointed by the governor with the advice and consent of the Senate. Said board act as commissioners of lunacy, and have full power with or without expert assistance to investigate as to the condition of any inmate of a State asylum, to hear complaints, etc. Inmates of asylums may send sealed letters to this board.—*Laws of* 1881, chap. 298.

Whenever any resident of this State, or any person found therein whose residence cannot be ascertained, shall be or supposed to be insane, application may be made in his behalf, by any respectable citizen, to the judge of the county court, judge of the circuit court, or any judge of a court of record, in and for the county in which he resides, or, in case his residence is unknown, the county in which he is found, for a judicial inquiry as to his mental condition, and for an order of commitment to some hospital or asylum for the insane. The application shall be in writing, and shall specify whether or not a trial by jury is desired by the applicant. On the receipt of said petition, the judge to whom it is addressed shall

appoint two disinterested physicians, of good repute for medical skill and moral integrity, to visit and examine the person alleged to be insane, and such physicians shall proceed, without unnecessary delay, to the residence of the person supposed to be insane, and shall, by personal examination and inquiry, satisfy themselves fully as to his condition, and report the result of their examination to the judge.—See *Laws of* 1883, chap. 35.

Such report must be substantially in the form of answers to a series of full questions concerning the patient, provided specifically by the statutes.—See *Laws of* 1883, chap. 35; and *Laws of* 1881, chap. 202.

Upon receipt by the county judge of such application or petition, he may, if he deems the public safety requires it, order the sheriff to take and confine such alleged lunatic, pending further proceedings, in a specified place.—*Laws of* 1881, chap. 202.

Upon receipt of the report of the examining physicians, the judge may, if no demand has been made for a jury, order the commitment to an asylum of the person in question, or, if not fully satisfied, may make additional investigation of the case. At any stage of the examination, the person alleged to be insane, or his friends, may demand a jury trial, and have the right to be assisted by counsel.—*Laws of* 1880, chap. 266.

Upon application by any respectable citizen, there may be a rehearing and further inquiry as to any person confined in an asylum, or other place of confinement, upon commitment as an insane person.—*Laws of* 1881, chap. 202.

No physically infirm or mentally imbecile person, not deemed to be dangerous when at large, shall be committed as an insane person to any hospital or asylum for the insane solely because of such infirmity or imbecility.—*Laws of* 1881, chap. 202, sec. 6.

Guardians may be appointed for the insane, by the county courts, to take care of the estates of their wards.—*Rev. Stats.*, sec. 3989 *et seq.*

Abuse or neglect of inmate of any hospital for the insane is punishable by imprisonment for one year, or by fine of two hundred dollars.—*Rev. Stats.*, sec. 4389.

APPENDIX B.

ADMITTED. SUNNYSIDE MEDICAL RETREAT. DISCHARGED.

Name.	Age.	Nativity.	Date.	Disease.	Date.	Name.

Queries for Patients' Friends to answer, to insure uniformity of results by Physicians in keeping record of cases.

QUERIES.	ANSWERS.
1. What is the name of the patient? Age? Place of birth? Residence?	
2. Is the patient married, or single, or widowed? How long since first married or widowed? If patient has had children, state their number, and the date of the birth of the last.	
3. What is the profession or occupation, and reputed pecuniary circumstances of the patient? If a female, state profession or occupation, etc., of father or husband.	
4. Is the patient a professor of religion?	
5. What is the original disposition and intellectual capacity of the patient? Mention general habits of life, predominant passions or prejudices, and any habitual vice, or intemperance; does the patient use ardent spirits, opium, tobacco, etc.?	
6. *How long* has the patient been insane? Did the disorder come on gradually or suddenly?	
7. Has the patient been insane previously? If so, specify the *date*, *duration*, and *form* of *each* previous attack.	

QUERIES.	ANSWERS.
8. How long before accession of insanity were any such precursory symptoms observed as the following, viz.: unusual depression or elevation of spirits, or any remarkable alteration in temper, disposition, feelings, opinions, conduct, sleep, appetite, state of the bowels, or health of the patient? Previous to these symptoms, had the patient been remarkable for any degree of oddity, eccentricity, or mental infirmity?	
9. What have been, or are, the prominent symptoms of the malady? Has any obvious change in its form occurred? Does it appear to be increasing, decreasing, or stationary?	
10. Are there lucid intervals or any great remissions or exacerbations, and do such changes occur at uncertain times, or at stated periods?	
11. Does the patient rave indifferently on various subjects, or chiefly on one? What is that subject? Mention particularly any permanent or remarkable illusions.	
12. Has the patient ever threatened or attempted to commit suicide or any act of self-injury? By what means? Is the propensity now active?	
13. Does the patient manifest any disposition to injure other persons, and how? Or cherish any malicious design? Is the morbid train of thought excited by any particular subject or event?	
14. Is the patient inclined to tear clothes or to break windows or furniture?	
15. Since the commencement of the insanity, what have been the patient's habits? State particularly whether the patient is attentive to the calls of nature.	

QUERIES.	ANSWERS.
16. What is supposed to have been the exciting cause of the insanity? Is it a moral cause, such as disappointment, fright, love, etc., or a physical cause—fever, the immoderate use of any intoxicating agents, bodily injuries, serious illness or accident affecting the nervous system, etc.?	
17. Does any constitutional or hereditary predisposition exist in the family of the patient to nervous affections? Were any relatives of the patient ever insane? If so, state particularly whether on the father's or mother's side, or both.	
18. Was the head of the patient ever severely injured?	
19. Is the patient subject to periodical attacks of any other malady; to any unusual discharge, or to suppression or obstruction of any customary discharge; to sores, eruptions, rupture, epilepsy, or palsy? Specify any bodily infirmity or disease of the patient.	
20. What has been done for the recovery of the patient? And with what effect? Mention particularly whether depletion by blood-letting, leeches, cathartics, low diet, etc., has been employed, and to what extent?	
21. Has the patient been subject to any mechanical restraint? If so, specify the length of time and the manner in which the restraint was applied.	
22. Has the patient ever been treated for insanity in any other asylum for the insane? If so, how often and how long on each occasion? When, in what state, and, if not cured, for what reason was the patient discharged?	
23. You are requested to state any other circumstances which you may think of interest or importance.	

APPENDIX C.

RÉSUMÉ OF TREATMENT OF THE INSANE.

Primarily, give plenty of nutritive food, and give barks, wine and iron, or malt liquors, when indicated.

Warm clothing and bedding, and a moderately warm and dry atmosphere, and plenty of occupation and exercise,—a *sine qua non* in the treatment of the insane, and change of scene and surroundings.

℞. Fl. Ext. Hyoscyami, ... gtt. x.
Am. Tinct. Lupulin, ... ʒj.
Camphoræ (Neergaard), ... gr. v to x.
Syr. Aurantii, ... ʒij.
Aquæ Camph., ... ʒvi.
M. et ft. haust.

Useful in asthenic cases as narcotic and sedative.

A good sedative pill in general paralysis of the insane, and in incipient mental disorder, with some excitability, is the following:

℞. Zinci Valerianat., ... ʒj.
Ext. Belladonna, ... gr. ij.
M. et ft. pil. No. 30. Sig. Pill every 2 hours.

Narcotic friction of scalp with Ungt. Bellad. Comp. is also old, but useful at times.

℞. Ext. Belladonna (Allen's), ... ʒj.
Morphia Sulph., ... ʒj.
M. et ft. ungt.

To subdue inordinate excitement, use the prolonged warm bath with cold effusions to head, protracted an hour or two, and followed, if necessary, by pill of camphor, turpentine and hyoscyamus.

Narcotic baths of 2 lbs. of henbane, belladonna, hemlock, and cherry laurel leaves, infused in hot bath, are excellent, even though old.

Tinct. digitalis, carried to 60 minims ter die, after a mercurial cathartic, produces sleep, quiet, and restoration to health in subacute mania.

In delirium tremens ½-ounce doses of digitalis, or

℞. Chloral Hyd., ... ʒij.
Tr. Hyoscyamus, ... ℥ss.
Syrupi, ... ʒiv.
M. et sig. Dose, tablespoonful, to be repeated as necessary.

Monobromide of camphor in puerperal mania, after 10 grains of calomel, followed by a saline, is a specific.

In nymphomania, 4 grains camph. monobromide every three hours after regulating secretion will soon cure the patient.

If nymphomania is accompanied by clitoric irritation, we may, with advantage, remove the clitoris.

In uterine irritation in insanity, which keeps up sleeplessness, use suppositories of 1 grain stramonium at bed-times. It quiets ganglionic nerves of uterus efficiently, and have displacement and flexion remedied at once.

In dysmenorrhœa in insanity use Schiefflin's fluid extract viburnum prunifolium (black haw) ʒss to ʒj every hour until relief is experienced. Very valuable in ordinary dysmenorrhœa.

In hysteria and hysterical mania, the introduction of a little pill of ungt. belladonnæ comp. into the os uteri acts like magic.

℞. Ext. Belladonnæ (Allen's), ... ʒj.
Morph. Sulph., ... ʒj.
M. et ft. ungt.

A combination of iron, phosphorus, zinc and strychnia, antagonizes cerebral degeneration in insanity.

℞. Ferri Redact., ... gr. ii.
Zinci Phosphidi, ... gr. $\frac{1}{10}$ to $\frac{1}{5}$.
Strychniæ Sulph., ... gr. $\frac{1}{60}$ to $\frac{1}{32}$.
M. et ft. pil. No. 1, t. i. d., after meals.

With a moist, relaxed state of the skin, cold extremities, shrivelled surface, pale complexion, and feeble circulation, use stimulants and full diet, and centric galvanization, carb. am. or old whiskey or port.

In great depression, melancholia, especially if religious or suicidal, a course of prolonged warm baths, with gradually increasing doses of morph. hydrochlorate, will antagonize the morbid psychic state and cure the patient quickly.

Enveloping the whole person in a sheet wrung out of hot mustard water, and putting the patient to bed is a valuable sedative measure, with dry cupping at back of neck.

Use all your mental resources to weaken and dissipate false ideas, a happy mixture of kindness and firmness.

Remember, that hallucinations may be troublesome and disturb repose, but if the individual acknowledges their falsity, he or she is sane. Prolonged dry cupping may relieve this symptom.

We can control those tearing everything to pieces leaving themselves naked, which is due to hyperæsthesia of the body, by monobromide of camph., Clin's capsules (4 grs.) ter die.

Fluid extract ergot (Squibb's) in ʒss. to ʒj. thrice daily, is the physiological antagonist to states of recurrent mania and chronic mania with lucid intervals, and also to epileptic mania; may be combined with the bromides.

In states of great motor excitement with homicidal impulses, fluid extract conium in ʒ¼ to ʒ ½ doses, or ʒj, may be used to quiet motor brain centres; produces quiet and muscular relaxation.

Puerperal mania is generally due to the absorption of the retained products of conception, which causes septicæmia, and we therefore give a mercurial cathartic, followed by salines, and 4 grains monobromide camphor ter die.

In hallucination with excitement, dry cups at back of neck, prolonged warm baths, and 30 grains sodium bromide, with 30 minims tinct. cannabis indica in combination, ter die, will produce quiet and tranquillity. In dementia can. indica has no effect.

Nourishment.—The nourishment of a sane man is generally insufficient for an insane. Full feeding means tranquillity; insufficient diet, excitement.

Diuretics.—When the urine of the insane is scanty and high-colored, use diuretics, such as sp. ether., nit., lig. am. acetat., or inf. of digitalis.

Carefully examine daily the state of the pulse and skin, the head, the extremities, the tongue, the bowels, the urine, and regulate the catamenia. If the action of the liver is sluggish, give dilute nitro-muriatic acid, 15 gtt. in ʒj of tinct. gentian. comp., ter die.

Restraint.—The entire disuse of restraint will soon be possible, as insanity is gradually assuming in our country a milder type than formerly. The disuse of restraint should be the rule and system.

Occupation and exercise in the open air for the insane cannot be insisted on too strongly This, with full feeding and warm baths, together with change of scene, will cure many patients..

Epileptic and suicidal patients should always be watched throughout the night by a night attendant.

Sleep.—We should remember that sleep is the first of medicines as a physiological antagonist to the states of an inordinate degree of excitement and over activity of nervous system or mental anxiety.

Massage and *electricity* are of inestimable service in the neurasthenia which is often the incipient stage of insanity, and rest for the overworked brain; the *galvanic current* antagonizes congestive states of the brain.

Proper diet and exercise, change of air and scene, and useful and agreeable occupation of the mind, I have come to believe, by observation, to be the most valuable means at our command in the treatment of insanity.

By the foregoing we do not at all undervalue the medicinal therapeutics of insanity when judiciously applied.

Disorders of the digestive organs, indicated by coated tongue, constipation, flatulence and morbid appetite, may be regulated by mist. rhei, sodæ and gentian, or the triplex pill, when well made.

In recent cases, rapid recovery may follow copious evacuations of the bowels and free diuresis, followed by a course of prolonged warm baths. The latter calms general mental excitement wonderfully.

The subsidence of excitement is not always the immediate precursor of convalescence. Having removed from your patient all moral causes of excitement, do not administer narcotics in large doses, but be content to apply remedies calculated to correct the disorders of the other bodily functions, and *time*, with good hygiene, will often cure your patient.

Sleeplessness, accompanied by high nervous excitement, is more safely combated by prolonged warm baths, with cold to the head, than by medicine, and tranquillity and uninterrupted rest will often follow.

Insanity is a disease generally accompanied by bodily disorders, and these we must remedy. When the digestive organs have resumed their healthy condition, when the pulse becomes natural, and there is no unusul heat or dryness of the skin, we must rely on time and moral treatment to cure our patient.

Importance of Good Nurses.—Have no nurse for your sick insane patient, either male or female, with whom you could not place your wives, brothers or sisters, and always treat your patient with the utmost attention, delicacy and respect. They *always* respond to such treatment.

When the mind is weak, but slowly recovering its vigor, a good nurse will keep a patient ordinarily cheerful and happy, while a poor one will throw the patient into a state of anxiety and depression. A good nurse will have the *confidence*, *respect* and *affection* of her patient.

We must remember that a suicidal patient is a recoverable case, but they are *always* on the look-out for means of self-destruction, and the nurse must exercise unremitting vigilant watching; when the suicidal act has once been meditated, *it is an imperative duty* to watch such a patient.

While we can often trust the veracity of the insane, as to going and coming punctually, it is not safe to do this when the hazard is that of life in a suicidal patient. Such patients often throw the inexperienced and unskilled off their guard and commit suicide.

We can inculcate self-respect and self-control more often in mental disease than many imagine. Hardly any insane man or woman is beyond the reach of a motive if rightly presented.

The word of a violent patient to be quiet, industrious, and orderly, is often to be relied on in hospital treatment, and we thus avoid the use of restraint.

I have often heard the insane express regret for their acts and language, and have seen them behave afterwards with perfect propriety. In matters of religion and morality we should treat the insane as sane while under hospital treatment, and inculcate self-respect and self-control constantly. Inculcate in such patients all the habits of rational life.

Treat them kindly and politely, inquire after their health, hear patiently their stories, and we shall thus gain their affection and confidence. Respect your patient, and he or she will respect themselves. Treat them as rational beings, and they will respond every time. Trust your patient, unless suicidal, and he will rarely abuse your confidence. Let

your intercourse with your patient be familiar and parental, and use a mild and gentle tone in speaking to them. Encourage and cheer them when despondent; soothe and calm excitement, and do not leave your patient, if possible, until you have done this.

Never lay violent hands on any patient, except in self-defence, which is very rarely necessary; and never cower or allow yourself to be looked out of countenance. See that patients have a pleasant and comfortable temperature and light cheerful games and amusements. Provide neatly furnished rooms to add to your patients' self-respect, and provide good garments for them. Finally, provide easy and pleasant occupation for your patients, and they will be contented and happy.

APPENDIX D.

CASES ILLUSTRATED BY THE PORTRAITS IN FRONTISPIECE.

No. 1, in the upper left-hand corner, is the portrait of a case of suicidal melancholia, in an Italian forty years of age. The cause of the insanity was supposed to be grief on account of an unfortunate love affair in Italy, after which he came to this country, and soon after landing became insane. No family history could be obtained. He refused all food, tried to starve himself to death, and was fed by the stomach-tube for sixty-three days.

No. 2, in the upper right-hand corner, is the portrait of a case of dementia, following acute dementia, she was very violent and dangerous at times. Was suspicious and watchful, with delusions of fear and persecution while maniacal. Her face exhibits her disposition very well. Sullen, taciturn, and ever ready for mischief.

No. 3, in the centre, represents a case of epileptic mania, in a German twenty-eight years of age, on the verge of dementia. Has been epileptic from youth up, and has violent maniacal attacks preceding the epileptic paroxysm, during which he is homicidal, requiring restraint. In the interval between the paroxysms, he worked in the wards of the asylum of which he was an inmate, and was quiet and polite unless irritated or annoyed.

No. 4, in the lower left-hand corner, is the portrait of a case of dementia, having passed through the stages of depression and mania. She was good-natured and happy, always laughing, but had not the slightest trace of intellectual power left.

No. 5, in the lower right-hand corner, is the portrait of a case of general paralysis of the insane, or paralytic dementia. He was a typical case, having the shuffling gait, the slurring speech, the delusions of wealth and grandeur, and more or less delirium at times.

Every portrait in this plate expresses very well the physical state of the individual it depicts. The physiognomy of the insane is here seen most typically.

APPENDIX E.

LITERATURE OF DISEASES OF THE MIND.

1689. Johannis Helfrici—Praxis Medica. Articles—Mania and Melancholia.

1712. Etmuller—Etmullerus abridged, etc., translated 1712. Article—Deficiency of Rational Operations.

1716. Salmon—The Practice of Physic, etc. Articles—Hypochondriac Diseases in Men and Hysteric in Women and Madness.

1730. Shaw—A new Practice of Physic, etc. Articles—Madness and Hypochondriasis.

1763. Sauvages—"Nosologia Methodica."

1763. Mead—The Medical Work of Dr. Richard Mead. Articles—Madness and Hypochondriasis.

1765. Brookes—The General Practice of Physic, etc., by R. Brookes, M.D. Articles—Hypochondriasis and Madness.

1773. Gregory—Manuscript Notes on the Lectures of John Gregory, M.D. Articles—Mania and Melancholia.

1791. Cullen—First Lines on the Practice of Physic. By Wm. Cullen, Prof. in the University of Edinburgh. Articles—Mania and Melancholia.

1792. Daquin—La Philosophie de la Folie, etc. Physician to Hospital for Insane and Hotel-Dieu of Chambery.

1792. Fodéré—On Cretinism.

1797. Darwin—Zoonomia, etc. By Erasmus Darwin, M.D. Articles—Insanity and Hypochondriasis.

1801. Motherby—A new Medical Dictionary, etc. Article—On Insanity.

1802. Villermay—Recherches Historiques et Medicales sur L'Hypocondrie, etc. By Sec. Louyer Villermay, Physician, etc.

1802. Denman—An Introduction to the Practice of Midwifery. Article—On Mania.

1806. Cox—Practical Observations on Insanity, etc. Second edition.

1806. Reese—On Melancholia, in a Practical Dictionary, etc.

1809. Pinel—Traité Medico-Philosophique sur l'alienation Mentale. By Ph. Pinel, consulting physician to his Majesty the Emperor, etc. Second edition. Also in 1809 Hoffbauer of Halle on "Psychology in its Chief Applications to the Administration of Justice."

1809. Haslam—Observations on Madness and Melancholy. By John Haslam. Second edition. Also "Medical Jurisprudence as it Relates to Insanity."

1811. Crowther—Practical Remarks on Insanity, etc. By Bryan Crowther, member of Royal College of Surgeons, and Surgeon to Bridewell and Bethlem Hospital.

1812. Dubuisson—Dissertation sur la Manie.

1830. Rush—Medical Inquiries and Observations upon the Diseases of the Mind. By Benjamin Rush, M.D., Prof. of the Institutes and Practice of Medicine and of Clinical Medicine in the University of Pennsylvania. Fourth edition. Date of preface 1812.

1821. Armstrong—Practical Illustrations of Typhus Fever, etc. Article—Insanity.

1817. Mayo—Remarks on Insanity, etc. By Thomas Mayo, B.M., Fellow of Oriel College, Oxford.

1817. Thomas—The Modern Practice of Physic, etc. Article—Madness.

1817. Spurzheim—Observations on the Deranged Manifestations of the Mind, or Insanity.

1818. Hallaran—Practical Observations on the Causes and Cure of Insanity. By Wm. S. Hallaran, M.D., physician to the Lunatic Asylum of Cork. Second edition.

1820. Georget—De la Folie, etc. Par M. Georget, Docteur en Médecine de la Faculté de Paris, Ancien Interne de 1re classe de la division des aliénées de l'Hospice de la Salpêtrière. Also in 1827 "Des Maladies Mentales Considérées dans leurs Rapports avec la Législation Civille et Criminelle."

1823. Willis—A Treatise on Mental Derangement. By Francis Willis, Fellow of the Royal College of Physicians.

1823. Chapman—Elements of Therapeutics, etc. Article—On Mania.

1823. Broussais—Monograph on Insanity.

1826. Guislain—Traité sur l'Alienation Mentale, etc. Par Joseph Guislain, Médecin à Gand. A Prize Essay.

1826. Calmeil—De la Paralysie considérée chez les Aliénés, etc. Par L. H. Calmeil, Docteur en médecine de la Faculté de Paris, Premier Interne en médecine à la Maison Royale des aliénés de Charenton.

1826. Voison—Des Causes Morales et Physiques des Maladies Mentales.

1827. Knight—Observation on the Causes, etc., of Derangement of the Mind, founded on an extensive Moral and Medical Practice in the treatment of Lunatics. By Paul Slade Knight, many years Surgeon of the Lunatic Asylum for the county of Lancaster, etc.

1827. Seyer—A Dissertation on the Features and Treatment of Insanity.

1828. Burrows—Commentaries on the causes, etc., and Treatment, etc., of Insanity. By George Mann Burrows, M.D., member of the Royal College of Physicians of London.

1829. Gregory—Elements of the Theory and Practice of Physic. By George Gregory, M.D. Article—Mania.

1831. Combe—Observations on Mental Derangement, etc. By Andrew Combe, M.D.

1832. Seymour—Observations on the Medical Treatment of Insanity.

1832 Andral—Monograph on Insanity.

1832. Esquirol—Observations on the Illusions of the Insane, and on the Medico-legal question of their confinement, etc. Maladies Mentales.

1836. Neville—On Insanity, its nature, etc.

1836. Allen—Essay on the Classification of the Insane.

1837. Mackintosh—Principles and Practice of Physic. By John Mackintosh, lecturer, etc. Articles—Insanity and Hypochondriasis.

1837. Prichard—A Treatise on Insanity, etc. By James Cowles Prichard, M.D., F.R.S., etc. American edition.

1838. Ellis—A Treatise on the Nature, Symptoms, Causes and Treatment of Insanity, etc. By Sir W. C. Ellis, M.D., etc.

1838. Eberle—A Treatise on the Practice of Medicine. Article—Mental Derangement.

1838. Mayo—Elements of the Pathology of the Human Mind.

1838. Esquirol—Des Maladies Mentales, etc. By E. Esquirol, the Médecin en chef of the Asylum at Charenton.

1839. Hill—A Lecture on the Management of Lunatic Asylums, and the Treatment of the Insane. By Robert Gardiner Hill, House Surgeon of the Lincoln Lunatic Asylum.

1839. Trélat—Recherches Historiques sur la Folie. Par Ulysses Trélat, Docteur en Médecin, Ancien Interne de la Maison des Aliénés de Charenton.

1839. Cazauvieilh—Du Suicide de l'Alienation Mentale, etc.

1839. Hooper—Lexicon Medicum, etc. Articles—Mania and Melancholia.

1840. Morison—The Physiognomy of Mental Diseases. By Sir Alex. Morison, M.D., Physician of Bethlem Hospital, the Surrey Asylum, etc.

1840. Leuret—Du Traitement Moral de la Folie. By F. Leuret, Physician to the Bicêtre.

1840. Dr. W. A. F. Browne—Supt. Crichton Lunatic Asylum at Dumfries. Article—On Asylums. Article—Mania.

1841. Bingham—Observation on the Religious Delusions of Insane Persons.

1841. Millingen—Aphorisms on the Treatment and Management of the Insane, etc. By J. S. Millingen, late Med. Supt. Hanwell Asylum.

1841. Dr. Bell—Report of Utica Asylum for the Insane.

1841. Dr. Kirkbride—Report of Pennsylvania Hospital for the Insane.

1842. Westminister Review—Non-Restraint. Article.

1842. McCormac—Methodus Medendi, etc. Article—Mania.

1842. Dr. Forbes Winslow—On the Preservation of the Health of Body and Mind. By Forbes Winslow, member of the Royal College of Surgeons of London, etc.

1842. Crichton—Reflections on Remedial Treatment. By Sir Alex. Crichton.

1842. Dr. Brigham—Report of Hartford Retreat for 1842.
1842. Earle—Letter by Pliny Earle, M.D., on Treatment of Insanity
1842. Dunglison—The Practice of Medicine, etc. Article—Mental Alienation.
1842 and '43. Reports of Visiting Committee of the County Lunatic Asylum near Gloucester, England.
1843. Falret—Considérations Générales sur les Maladies Mentales, par M. Falret, Médecin en chef de l'Hospice de la Salpêtrière, etc.
1843. Southerland—Clinical Lectures on the Theory and Medical Treatment of Insanity.
1844. Ray—Report of Maine Insane Asylums. Remarks on Restraint.
1844. Bell—Report of McLean Asylum. Remarks on Restraint.
1844. Dr. Earle—Report of Bloomingdale Asylum. Means of Bodily Restraint.
1844. Dr. Brigham, of Utica Asylum—Treatment of Violent Maniacs.
1844. Dr. Kirkbride, of the Pennsylvania Hospital for the Insane—Restraint and its abuse in European Institutions.
1844. Dr. Samuel B. Woodward—Report of Massachusetts State Lunatic Hospital at Worcester. Remarks on Treatment of Insanity.
1844. Pinel—Traité de Pathologie Cérébrale, etc. Par Scipion Pinel, Ancien Médecin des Alienes de la Salpêtrière et de Bicêtre, etc.
1845. J. Moreau (du Tours)—Du Hachish, etc. Par J. Moreau (de Tours), Médecin de l'Hospice de Bicêtre, etc.
1845. De Boismont—Des Hallucinations, etc. Par A. Brierre de Boismont, Docteur en Médecin de la Faculté de Paris.
1844–45. Report of the Metropolitan Commissioners in Lunacy to the Lord Chancellor.

THE FOLLOWING IS A LIST OF THE CHIEF AUTHORS WHO HAVE WRITTEN ON MENTAL DISEASES SINCE 1845, WITHOUT REFERENCE TO CHRONOLOGICAL ORDER.

Boyd, Dr.—Vital Statistics, Journal of Mental Science, January, 1865, p. 61.
Bucknill and Tuke, Drs.—Manual of Psychological Medicine.
Clouston, Dr. T. S.—On Tuberculosis and Insanity, Journal Mental Science, April, 1863
Griesinger, Dr. W.—Die Pathologie und Therapie der Psychischen Krankheiten.
Haslam, Dr. J.—The Sound Mind.
Hammond—On Insanity; also article in Diseases of Nervous System.
Leidesdorf, Dr. M.—Die Pathologie und Therapie der Psychischen Krankheiten.
Moreau, Dr. J.—Psychologie Morbide.
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With respect to the anatomy and physiology of the nervous system—the pathology of the nervous system and mind and pathological anatomy—and the therapeutics of the nervous system and mind, the student will be amply repaid by the careful perusal of the many articles contributed to these departments by Drs. Ray, Kirkbride, Earle, Dr. J. S. Jewell, Dr. H. M. Bannister, Dr. Wm. A. Hammond, Dr. Meredith Clymer, Dr. S. Weir Mitchell, Dr. E. Seguin, Dr. Charles H. Hughes, Dr. Edward C. Spitzka, Dr. James J. Putnam, Dr. Samuel R. Webber, Professor E. T. Mills, Dr. Amidon, Dr. A. J. C. Skene, Dr. Landon Carter Gray, Dr. J. C. Shaw, Dr. J. M. Da Costa, Dr. R. Bartholow, Dr. J. Marion Sims and others, whose indefatigable labors in this field command an equal respect with those of Westphal, Prof. Erb, Charcot, Krafft-Ebing, Hughlings Jackson, Winslow, and Bucknill and Tuke abroad.

1875

New York May 31st.

My Dear Sister Sue,

I take my pen in hand to address to you these few lines. Pardon my long delay and apparent neglect in not having written to you ere this; but now I thank the blessing of God have been restored to my senses and would or, wish to be kept so but here in this God forsaken City I have been insulted most grossly & foully all because I will not turn my self & join the Roman Catholic Church

LETTER WRITTEN BY A PERSON SUFFERING FROM ACUTE MANIA

April 1882 Saturday

Dear Lizzie I wish
you and I could
live in a castle
let us go off in
the nights when
everyone is asleep
and get aboard
the boat and
go to Ireland
and visit the
Queen of England

LETTER WRITTEN BY AN EPILEPTIC WITH CONGENITAL FEEBLE INTELLECT.

INDEX.

A.

Abdominal disorders, insanity from, 259
Abstract of Lunacy Laws in every State of the Union, see Appendix, 631
Active hereditary neurosis, 49, 54
Acquittal on the ground of insanity, cases of, 90
Acute insanity, pathology of, 139
Ætiological classification, 47
Ætiology of insanity, 52, 53, 54, 55, 58
Affective insanity, 107
Age, influence of, 55
Ajax, his insanity, 37
Alalia, 329
Alcohol as a cause of insanity, 56
Alcoholic insanity, 264
Allbutt, Dr. Clifford, on visceral neuralgia, 514
Alleged increase of lunacy, 52
Althaus, Dr., on electricity, 603
American asylums, statistics of, 163, 169, 188, 193, 206
Amidon, 335
Amusements for the insane, 187, 202, 218
Ancient classifications, 44
Anæmia, cerebral and spinal, 490
Anæsthesia, 331
Anstie on insane diathesis, 49; on neuralgia, 516; on electricity, 590
Appendix, 631
Arachnoid, appearance of, in insanity, 140, 146
Arnold, trial of, 121
Arsenic, chloro-phosphide, 251
Arthritic insanity (see Insanity from rheumatism and gout), 261
Asylums, care and treatment in, 209, 216, 217, 218
Asymmetry of skull, 619
Attendants, 209
Austria, laws as to mental responsibility in, 298
Autopsies, examination, what to observe, 43

B.

Baillarger on paralytic dementia, 103
Bartholow, Dr. Roberts, 335; on electricity, 548
Bastian, Dr., on bloodvessels in insanity, 141
Baths, 245
Bannister, 335
Bayle on pathology of paralytic dementia, 98
Benedikt, Dr., on criminal psychology, 120
Blandford, Dr., on diagnosis of moral and emotional insanity, 110; on bloodvessels, 141; on treatment, 157, 282
Blood, examination of, 144
Bloodvessels (cerebral) in insanity, 141, 151
Brain fatigue, 63
Brain, criminal, formation, 626
Brain, normal structure of, 133; changes in insanity, 139
Broadbent on cerebral syphilis, 160, 315
Bromide of sodium, 233, 238
British asylums, statistics of, 164
Browne, Dr. Crichton, treatment, 242; on size of fœtal head, 57; on optic thalami, 136; on admission to and detention in asylums, 177
Bucknill and Tuke, legal tests of responsibility, 90; hints in giving evidence, 91; classifications, 38; Bucknill's definition, 44; Tuke's classification, 49; Bucknill's classification, 52; on diagnosis, 77; on moral or emotional insanity proper, 107; Dr. Bucknill on commitment, detention and discharge of patients, 178; on syphilitic insanity, 263; on kleptomania and pyromania, 265
Buzzard, Dr. Thomas, on centric galvanization, 587; on electrical examination and treatment in peripheral paralysis of the facial and oculo-motor nerves, 596

C.

Causes of cerebral hæmorrhage, 340
Causes of insanity (see Ætiology), 52–58
Calmeil on general paralysis, 98; on epileptic insanity, 130
Cambyses, his insanity, 37
Camphor, mono-bromide, 239
Cannabis indica, 233, 238
Capacity, testamentary, 70, 87
Carpenter, Dr., on hereditary transmission of acquired psychical habits, 138
Case Book, form of (see Appendix B).
Cases illustrating treatment of insanity, 243, 245
Cases illustrating pathology and morbid histology of insanity, 153

Catamenia in prognosis in insanity, 75
Catalepsy, 469
Cells, degeneration of cerebral, 147
Cellular pathology, 147
Celsus, his classification, 38
Cerebellum, functions of, 132; lesions of, 337
Cerebral and spinal anæmia, 490
Cerebral electrization, 61
Cerebral embolism, 339; softening, 340, 540
Cerebral hæmorrhage, localization of lesion, 341
Cerebral hyperæmia, 537
Cerebral localization, 325
Cerebral syphilis, 63, 317; diagnosis and prognosis of, 317
Cerebritis or encephalitis, 496
Certificates of lunacy (see Appendix, Abstract of Laws), 176, 177, 178, 180, 181
Change of character in insanity, 70, 78
Charcot, Dr., on localization of brain function, 131; on locomotor ataxia, 519; on static electricity, 554
Charenton, asylum at, 281
Chloral, 235
Chemical causes of nervous diseases, 34
Chorea, 449
Chronic mania, 81
Civil incapacity, 86
Civil contracts, 87
Civilization, influence of, 59; foot-note, 55
Clarke, Dr. Lockhart, on general paralysis, 100
Classification of mental diseases, 40; Forbes Winslow on, 285
Climacteric insanity, 258
Clinical instruction in hospitals, 218
Clouston, Dr., on tubercular insanity, 142; on epilepsy, 425
Coke, his definition of idiocy, 105
Colloid degeneration in insanity, 150
Colon, insanity proceeding from, 259
Codification of the common law as to insanity, 303
Commissioners in lunacy, necessity for State boards, 296
Combe's definition of insanity, 44
Concealed insanity, 86
Congenital idiocy, 106
Congenital moral defect, 85
Congestion, cerebral, 537
Contractions, 330
Conium, 240
Commitment, discharge and detention of the insane, 175
Conolly, Dr., his definition of insanity, 44; his abolishment of restraint, 277
Corpora quadrigemina, functions of, 135
Consanguineous marriages, 56
Cortex of the brain, lesions of, 132, 133
Corpus striatum, lesions of, 132; functions of, 137
Cottage treatment of the chronic insane, 271
Cowles, Dr. Edward, on management of hospitals, 208
Cranial nerves, exit of, 502
Cranium, 43
Cretinism, 38, 42
Crichton royal institution, 54
Criminal lunatics, 189; their characteristic mental peculiarities, 190, 625
Criminal skull formation (criminal psychology), 618
Crime and insanity, 618
Crura cerebri, lesions of, 132
Curability of insanity, 162, 207, 208
Curable forms of insanity, 39, 75

D.

Da Costa on vertigo, 465
David, 37
Definitions of insanity, 43, 44
Delinquency often the result of cerebral imperfection, 109, 618
Delusions of the insane, 69, 96, 243, 245
Demeanor towards a patient, 158
Dementia: primary, 106; secondary, 106; diagnosis, 71, 80
Dementia paralytica (see General paralysis), 95
Deuteropathic insanity, 50
Development of the nervous system by evolution, 319
Diagnosis, pathology, and treatment of nervous diseases, 322
Diagnosis of insanity, 67; in criminal cases, 123
mania, 70, 79
melancholia, 71, 79
dementia, 71, 80
monomania, 83
eccentricity, 82
general paralysis, 72, 79, 80, 85
feigned insanity, 85
concealed insanity, 86
recovery, 72, 74
incomplete mania, 81
chronic mania, 81
incomplete primary mania, 81
moral or emotional insanity proper, 72, 84
congenital moral defect, 85
moral imbecility, 85
Diagnostic value of hereditary tendency, 78
previous attacks, 78
change of habit and disposition, 78
peculiarities of residence and dress, 79
Diathesis, insane, 49
Differential diagnosis between syphilitic insanity and paralytic dementia, 263
Digitalis, 240

Dipsomania, relations to insanity, nature, pathology, treatment, 354; premature mental decay in, 363; diagnosis of, 354; psychic symptoms of, 364; responsibility, 368
Dissection of bodies of the insane, 43
Disseminated or partial sclerosis in insanity, 149, 542
Domestic treatment of the insane, 224
Donn, Dr., on idiocy, 106
Dress, peculiarities of, 79
Dura mater, appearance of, in insanity, 140, 146

E.

Eads, Dr., 335
Earle, Dr. Pliny, on curability of insanity, 162; opium, 163
Earl of Shaftesbury on the admission, detention, and discharge of insane, 182
Early treatment, importance of, 157, 160, 203
Eccentricity, diagnosis of, 82
Education in its relations to insanity, 66
Edinburgh asylum (Morningside), 279
Electricity in neuralgia, 509
Electricity in the diseases of the nervous system, 546
Ekker on vessels of brain in insanity, 141
Emotional insanity, 47
England, insanity in, 275
Epilepsy: cause, pathology, treatment, 417, 562; cases, 422; effect on mind, 256, 305
Epileptic insanity, 129, 256; case of homicide, with epileptiform attack, 128; unconscious states in, 256, 305
Epithelium in insanity, 147
Ergot (fl. ext.) in insanity, 241
Erlenmeyer, 145; on paralytic dementia, 99
Ertzbischoff, Dr., on pathology of paralytic dementia, 99
Erotomania (nymphomania), 257
Esquirol, his classification, 45; his improvements, 215; on epileptics, 306
Etiology (see Ætiology), 52–58
Evidence, hints in giving, 91
Evidence of those mentally diseased, 88
Examination of cases, study, 43
Examination of the insane, 68, 81, 286
Exciting causes of insanity, 55
Excitement in relation to recovery, 74
Expert testimony, necessity for a new method of introduction of, 296
Expert testimony and the functions of experts, 92, 304

F.

Falret on epileptic vertigo, 129; on paralytic dementia, 103
Fear and fright as causes of insanity, 49
Feigned insanity, diagnosis of, 85
Ferrier, Dr. David, on lesions of the convolutions of the brain and cortex cerebri, 349; on localization, 131; on optic thalami, 136
Fever as a cause of insanity (see Post-febrile insanity), 260
Flint, Dr. Austin, on neuralgia, 505
Folie raisonnante, 107
Fournier on cerebral syphilis, 319
Food and work and amusement for the insane, 218
Frerichs on pathology of paralytic dementia, 99
France, insanity in, 281; law as to mental responsibility in, 298
Full feeding for the insane, 234

G.

Galvanization of sympathetic, 554
Galen, 45
General practitioner's duty in checking insanity, 65, foot note
General paralysis of the insane, 95, 255; cause, 95; psychology of, 95; mental processes in, 95; prognosis, 95; temperature, pathology, 97
General sclerosis, 149
Gestation, insanity of, 50, 257
Gesture, peculiarities of, 70
Gheel, lunatic's colony at, 221
Gouty insanity, 261
Gray matter of brain, morbid histology of, in insanity, 149
Gray, Dr. John P., on curability and treatment, 169; on commitment, detention, and discharge, 175; on restraint and seclusion, 172
Grief as a cause of insanity, 57
Griesinger on classification, 47
Guislain, his definition, 44

H.

Hamilton, 335
Hæmorrhage, cerebral, 340
Hallucinations of the senses, 68
Hammond, 335
Handwriting and composition of the insane (see Appendix)
Hartford retreat for insane, 206
Hardness of feeling exhibited by the insane towards friends, 69, foot note
Head and spine, affections of, as causes of mental disease, 56
Hebephremia, or pubescent insanity, 50, 257
Headache (see Neuralgia)
Hemiplegia, 329
Hereditary insanity, 54; predisposition as a cause, 54; affecting diagnosis, prognosis, treatment, 54

Hereditary transmission, 56; of allied but different neuroses, 56
Hints in giving evidence, 91
Histology and functions of cerebrum, 131
Histology (morbid) of mental diseases, 139
Hippocrates, writings, 38
Homicidal insanity, 130, 183, 301
Hospital wards, necessity for, in asylums for the insane, 187
Hospitals for the insane, 69, foot-note; 208, 216, 226, 272
Hughes, Dr. Chas. H., on moral or emotional insanity proper, 111
Hyoscyamus, 237
Hyperæmia (cerebral), 537
Hypochondriacal melancholia, 260
Hystero-epilepsy, 442
Hysteria, history, pathology, and treatment, 376
Hyperæsthesia, 331; of testes, 552; of uterus, 552
Hysterical insanity, 257
Hypothetical cases, 93

I.

Ideational or intellectual states, 49
Idiocy, 105; classification of, 106; prognosis, 105; definition, 105; treatment, 105
Idiopathic or primary insanity, 42, 48
Ill health as a cause of insanity, 60
Impulsive insanity, 127
Importance of early recognition of mental disease, 59
Impatience in relation to recovery, 72, 74
Imbecility, 42
Increase of insanity, 266
Inebriety, its cause, pathology and treatment, 354; its seat, 359
Indian hemp (see Cannabis indica), 233–238
Inflammatory disease of the brain and its membranes, 496
Inflammation and congestion of the brain tissue in mental disease, 100
Incurable forms of insanity, 40
Insanity in general, 37; clinical view of, 354
Insanity in the Middle States, 266
Insane, their condition before the era of hospitals, 161, 216; abstract of the common law on their confinement in different States of the Union (see Abstract in Appendix); can distinguish between right and wrong, 300; some apparently recover and deny they have ever been insane, and are bitter towards all who treated them as insane, 255
Insanity of pubescence, 257; from masturbation, 257; of gestation and pregnancy, 257; of lactation, 258; from abdominal disorder, 259
Insanity, its connection with organic qualities of the brain overlooked, 252; distinguished from depravity, 255; remission in the early stage, 73, 74
Influence of the seasons on insanity, 59
Intemperance as a cause of insanity, 56
International congress of alienists, their classification, 38
Injuries to the back without apparent mechanical lesion, 614
Irresistible impulse, 122, 303
Irritative lesion of the brain, 353

J.

Jackson, Dr. Hughlings, chorea, 451; experimental researches, 354; on epilepsy, 129, 420
Jewell, 335
Judges should not assume the functions of experts, 93
Juvenal, his mention of hellebore, 37

K.

Kirkbride, Dr. Thomas, statistics, etc., asylum, 193; on prompt treatment, 203; management and curability of mental diseases, 203
Klein, Dr., on ophthalmoscopic appearance, 144
Kleptomania, 118, 265, 306, 474; Maré, Browne, Savage, Ray, Tilt, etc., on, as a state of undoubted insanity, 265
Kolk, Van der, 427
Krafft-Ebing, Dr., his classification, 40, 42
Kussmaul and Tenner, experiments on epilepsy, 432

L.

Lactation, insanity of, 48, 258
Lancereaux on pathology of paralytic dementia, 98
Larceny in general paralysis, 306
Laycock's physiological classification, 46
Laros case, 478
Legal enactments in reference to insanity (see Appendix)
Legal tests of responsibility, 90
Lesions of the brain, 337, 349; pons, 332; crus cerebri, 333; optic thalamus, 334; of hemispheres, 335; of cerebellum, 337; of motor zone, 350; of sensory zone, 352
Lightning, case of stroke, and markings by, 607
Localization of chronic lesions of nerve-centres, 329, 331
Localization of brain functions, 131
Locomotor ataxia, nature and pathology, 518; Radcliff on, 525

Longevity of the insane, 161
Lord Moncrief of Scotland, on lunatics, 303
Lord Justice Blackburn on homicide, 303
Lord Chief Justice of England on responsibility, 303
Lunacy in England, 275
Lunacy laws, see Abstract of, in Appendix, 631
Lunatics, laws relating to (Appendix), 631
Lunacy, English commissioners of, 232
Luys, on pathology of paralytic dementia, 99
Lungs, disease of, in insanity, 261
Lunier, on intemperance as a cause of insanity, 56; paralytic dementia, 103
Lypemania, 45

M.

Magnan on general paralysis, 98
Major, Dr., on brain wasting, 141; on degeneration of brain cells, 148
Management of property of the insane, 89
Management of hospitals for the insane, 209, 216, 218, 224, 226
Mania, diagnosis of, 71, 81; treatment of, 254; acute, 254; chronic, 81; transitory, 130
Maré on pyromania, 265
Marcé on epilepsy with transitory mania, 130
Marriage, influence of, 56, foot-note; marriage contracts, 87; its impropriety when insanity is in the family, 56
Marriages of consanguinity, 56, foot-note
Masked epilepsy, 129, 130
Masturbatic insanity, 257
Mauriac, Dr. Charles, on syphilis of nervous centres, 317
Maudsley, Dr. Henry, on treatment, 224; classification, 47; on commitment, detention and discharge, 181
McLean Asylum, Somerville, Mass., 207
Medico-legal importance of epileptic attacks, 477
Mendacity of the insane, 49
Menstrual periods accompanied by increase of excitement, 61
Mechanical restraint and seclusion, 223
Medulla oblongata, lesions of, 132
Medical certificates of lunacy (see Abstract of laws in Appendix), 631
Medicinal treatment of mental disease, 233
Mental responsibility in criminal cases, 119, 129, 297, 307
Melancholia, diagnosis of, 71, 79; treatment of, 254; suicidal melancholia, 235, 250
Membranes, morbid histology of, 146
Mechanical cause of nervous diseases, 34
Menstruation (see Catamenia), 75
Menstrual psychoses, 61
Meynert on optic thalami, 136
Metaphysical theory of insanity, 39
Methomania (see Dipsomania and Inebriety), 353
Miché on the blood in general paralysis, 145
Mickle on syphilitic insanity, 262
Miliary sclerosis, 150
Mills, 335
Modern classifications of insanity, 44
Modern nervousness of men, 66
Monomania, diagnosis of, 83
Modern nervous disease, 311
Moral causes of insanity, 105
Monoplepia, 351
Moral imbecility, 108, 255, 624
Moral insanity, 107; synonyms, 107; ætiology, diagnosis, 72; nature, 107; admitted by the best observers, Dr. Hughes on, 111, 624
Moral treatment of the insane, 209, 216, 217
Morbid histology, 145; of acute and chronic insanity, 139
Morel, his classification, 38; definition, 44
Motor zone of brain, 349
Motor irritation, 330
Music, color, beauty, etc., as curative agents in insanity, 158

N.

Nature of brain lesions, 338
Nature, her efforts to restore mental equilibrium, 158
Nebuchadnezzar, insanity of, 37
Nerve fibres in insanity, 148; nerve-stretching, 509
Nerve-cells in insanity, 147
Nervous diseases (modern), disorders of, in general, 312
Neurasthenia, signs of, 60; motor symptoms of, 506; physical signs, 506
Neuralgia, 501
Neuralgia of brain in insanity, 149
Nichols, Dr. Chas., opinions on treatment of insanity, and statistics of insanity, 188
Non compos mentis, 105
Northamptom Lunatic Hospital (Mass.), 163
Nosology of insanity (see Classification), 40, 44
Nothnagel, on optic thalami, 136
Non-restraint, 172, 188, 224, 227
Nymphomania, 257

O.

Occupation, influence of, 202, 219, 220
Occupations, particular, 219

Occipital flatness, 621
Ophthalmoscope in mania, melancholia, etc., 143
Ophthalmoscope in diagnosis, 323
Opinions, medical, given in writing, 93, 94
Opium in the treatment of insanity, 234
Optic thalami, functions of, 135
Oxaluria, mania of, 145, foot-note

P.

Parish will case, 94
Paralysis from brain disease, 331
Parchappe, pathology, 139; classification, 46
Partial insanity, 81, 301, 303, 305, 308
Parturition, insanity of, 258
Paraplegia, 329
Pathological classification, 46
Pathology of insanity, 139, 153
Pathological diagnosis in brain diseases, 339
Peculiarities (see Diagnosis), 79
Pennsylvania Lunatic Hospital at Philadelphia, statistics of, 193
Periodical insanity, 243
Persecution, delusions of, 258
Phthisical insanity, 142, 261
Phthisis in insanity, 142 (also see chapter of cases), 261
Physiognomy in insanity, 70, 71, 80
Physiological classification, 46
Pia mater, changes in insanity, 140, 146
Pinel's and Esquirol's improvements, 215
Pinel on classification, 38
Pons varolii, hæmorrhage into, 132
Population, proportion of insane to the, 162
Poore, Dr., on electricity, 584
Post-febrile insanity, 260
Provision for the chronic insane, 271
Pregnancy, insanity of, 257
Previous attacks, 78
Prevention of insanity, 64
Progressive muscular atrophy, 329
Prodromic stage of insanity, 302
Proportion of sane to insane at home and abroad, 162 266
Premature mental decay in inebriety, 363; brain changes, 366
Prichard, Dr., on classification, 47
Private patients, treatment of, 224, 231
Prognosis of insanity, 74–77, 287. (Probability of recovery in any given case is in proportion to the *early age, physical condition and duration of the attack.*)
Progressive general paresis (syn. paralytic dementia), 95
Protopathic insanity, 50
Prognosis in cerebral hæmorrhage, 341
Psychical school of alienists, 47
Psychological classification, 47
Psychology of crime, 617
Pubescent insanity (hebephremia), 50, 257
Puerperal insanity, 258
Pulse in insanity, 243
Pupils in insanity, 243
Purgatives in insanity, 233
Pyromania, 118, 265

R.

Ramskill, Dr. J. S., on epilepsy, 439
Ray, Dr., on insanity, 93, 110; in memoriam of, 271; on epilepsy, 305; on restraint and seclusion, 226; on pyromania, 265
Reasoning mania or monomania, 107
Recovery often confounded with improvement, 73
Restraint, true doctrine of, Ray on, Nichols on, 226
Rest in insanity, 158
Recovery, diagnosis of, 72, 74
Recurrent mania, 243
Regional diagnosis of spinal cord and brain lesions, 319
Reform in the method of introducing expert evidence, 232, 296
Religious excitement as a cause of insanity, 260
Removal from an asylum, 72, 74
Remission, its occurrence in the early stages of insanity, 309
Reproductive organs, diseases of, in insanity, 257
Reynolds, Dr. J. Russell, on electricity, 556; on epileptic vertigo, 256; on chorea, 460
Responsibility of inebriates, 363; of the insane, 302–309
Rheumatic insanity, 261
Rindfleisch on disseminated sclerosis, 150
Rokitansky on pathology of paralytic dementia, 99
Rush, 270

S.

Sanity, diagnosis of mania from, 70
Scalp and cranium, 43
Sciatica, 503, 550
Science, changes in laws should keep progress with the advancement of cerebral pathology, 304
Sclerosis, 421
Sedatives in insanity, 291
Secretions (see Examination of blood and urine), 144
Séguin, 335
Self-control, absence of, in insanity, 300, 303
Sensory zone of brain, 352; sensorial irritation, 330
Sex, influence of, in insanity, 55
Sibbald, civil incapacity, 86
Simulation of insanity can be detected, 85; how distinguished from real insanity, 85

Skae, Dr., his classification, 47
Skey, Dr. F. C., on hysteria, 392
Skin, 79
Skull formation in criminals, 618
Sleep, 75
Small hospitals for the insane, Dr. Cowles on, 208
Somatic school of alienists, 50
Somato-ætiological classification, 48, 49
Softening of brain, 540
Somnambulism, 468
Special pathological changes in insanity, 146
Spencer, Herbert, on the emotions, 58
Spinal concussion, its medico-legal relations, 608
Spinal cord, lesions of, 331
Spitzka, 335
Statistics of different asylums: Bloomingdale, 188; New York State, 169; Pennsylvania hospital, 193; three State hospitals of Massachusetts, 163; etc., in general, 58
States of unconsciousness, 466
Stomach and intestines, diseases of, in insanity, 259
Suicidal insanity, 294
Suspicion a common trait of insanity, 262
Sutherland, Dr., on the urine in insanity, 145
Sydenham, Dr., on hysteria, 381
Sympathetic insanity, 42
Symptomatological classification, 45
Syphilitic insanity, 159; foot-note, 262
Syphilitic nervous disease, 315, 317

T.

Tables of causes often unreliable, 57
Temperament, insane, 49
Testimony, skilled, charged with being contradictory, etc., 92
Testamentary capacity, 70
Tests of responsibility, 307
Temperature of body in cerebral hæmorrhage, 340
Therapeutics of insanity, 233
Toxic insanity, 50
Trance state, 126
Transitory mania, 122, 126
Treatment of insanity, 157
Treatment of inebriety, 361, 372
Trembling, 330
Treatment of cerebral hæmorrhage, 343
Trouble and grief as causes of insanity, 57
Trousseau, 129
Tubercular disease in insanity, 261
Tuke, Dr. J. Batty, his histological researches in insanity, 145
Types of insanity, see frontispiece

U.

Ulysses, feigned insanity, 37
Unconsciousness, states of, 466
Uncontrollable impulse, 474, 475
Unnatural and motiveless crimes diagnostic of epilepsy, 305
Urine in insanity, 144, 145
Uterine disorders as a cause of insanity, 293
Utero-mania, 257

V.

Varieties of insanity in relation to treatment, 252
Vertigo, nature and treatment of, 462; static, 330
Vertex steepness, 621
Vital causes of nervous disease, 34
Visceral disease in insanity, 293
Visceral neuralgias, 504
Voison, Aug., on general paralysis, 102

W.

Warm baths, prolonged, in insanity, 245, 290
Webber, 335
Weakness of mind (see Idiocy, Dementia, and Epilepsy)
Westphal, on general paralysis, 100
Wills of the insane, 87
Winslow, Dr. Forbes, on insanity and its treatment, 283; on simple classifications, 285
Winn, Dr., on correlation of morbific forces, 142
Willis, case of, 122
Wille on syphilitic insanity, 262
Wilks on epilepsy, 435; on hysteria, 411; on electricity, 579
Work in the treatment of insanity, 202, 219, 220

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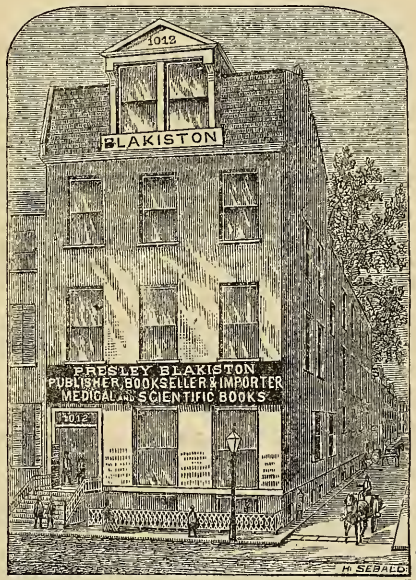

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